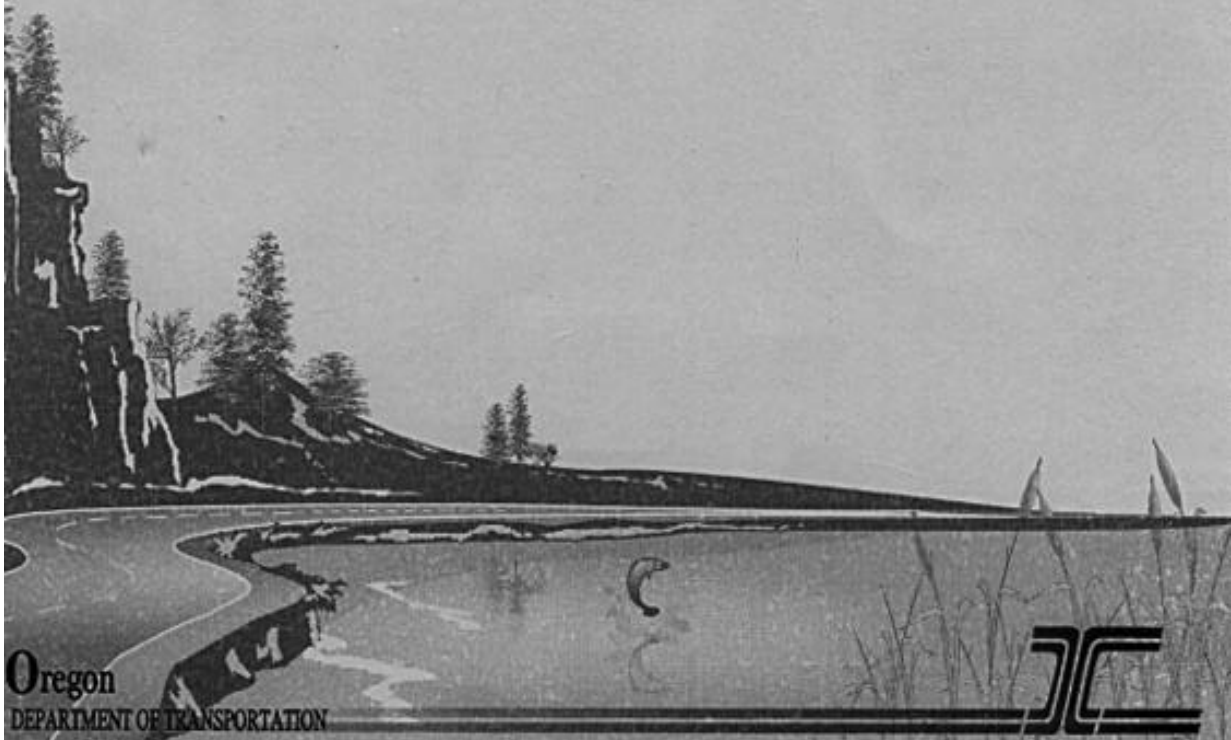
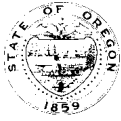


Oregon Department of Transportation

Routine Road Maintenance

Water Quality and Habitat Guide Best Management Practices July 1999





Oregon

John A. Kitzhaber, M.D., Governor

Department of Transportation

Office of the Director
135 Transportation Bldg.
Salem, OR 97310
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June 30, 1999

File Code:

Will Stelle Jr., Regional Administrator
NOAA/NMFS Northwest Region
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Seattle, Washington 98115-0070

Subject: Oregon Department of Transportation Commitment to Implementing
Minimization/Avoidance Measures for Maintenance Activities

The Oregon Department of Transportation (ODOT) is committed to being a partner in the Oregon Plan for Salmon and Watersheds. Part of this commitment is identifying and implementing measures, or best management practices (BMPs), to minimize potential environmental impacts associated with ODOT activities. The accompanying document represents the minimization/avoidance measures identified for routine road maintenance activities.

ODOT maintenance and environmental staff have been working with the National Marine Fisheries Service staff for the past year on a program that minimizes the impacts of routine maintenance activities on receiving streams. The Association of Oregon Counties and the City of Portland participated in the final development of the measures. We are hopeful that this document and program will meet the needs of the Clean Water Act and the Endangered Species Act.

This letter serves as a letter of commitment from the Oregon Department of Transportation to the National Marine Fisheries Service that ODOT will implement the measures, and abide by the commitments made for training, documentation and accountability. In addition, ODOT will continue to work closely with NMFS as we evaluate and adjust the routine maintenance program over time.

If you need additional information, or have any questions, please feel free to contact Sue Chase, the ODOT Salmon Program Manager, at (503) 986-3008.

Sincerely,

Grace Crunican
Director



Oregon

John A. Kitzhaber, M.D., Governor

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August 9, 1999

Sue Chase
Oregon Department of Transportation
806 Airport Rd. SE
Salem, Oregon 97310



RE: ODOT Routine Road Maintenance Water Quality Best Management Practices
Guide, July 1999

Dear Ms. Chase,

My staff has had the opportunity to review the Water Quality Best Management Practices document that was prepared for use by Oregon Department of Transportation (ODOT) maintenance personnel. We believe it is a good working document. We understand that it is for routine maintenance activities only. Larger construction projects will require separate review. We believe that the document is adequate to protect habitat during routine maintenance activities with the understanding that the document will evolve over time, as new information becomes available.

We appreciate the efforts that ODOT is making towards accomplishing the goals of the Oregon Plan and recovery of our fish and wildlife populations. We value the partnership that has developed between our two agencies. Thank you for the opportunity to work with you on refining this document. Oregon Department of Fish and Wildlife looks forward to working with ODOT on these issues and other aspects of your mission.

Sincerely,

Kay Brown
Director
Habitat Division

C Patty Snow, Habitat
Randy Reeve, Newport

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ACRONYMS

BMP	Best Management Practices
CMA	Calcium Magnesium Acetate
DEQ	Department of Environmental Quality
DSL	Department of State Lands
EPA	Environmental Protection Agency
ESA	Endangered Species Act
IPM	Integrated Pest Management (Integrated Vegetation Management)
MMS	Maintenance Management System
NMFS	National Marine Fisheries Service
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
USACOE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

DEFINITION OF TERMS

Channel: a channel is different from a ditch in that a channel is a facility that collects drainage water, can be parallel or perpendicular to the highway facility, and may or may not be a natural stream.

Clearzone: a roadside area, cleared of obstructions, designed to allow for vehicular recovery. Design area is determined by traffic speed, actual daily traffic, horizontal curvature, and embankment slope (1996 AASHTO Roadside Design Guide).

Danger Tree: Trees or snags, on or near the highway that are found to be weakened, unsound, undermined, leaning, or exposed so they may fall across the highway. When permission to remove the trees cannot be obtained, it is necessary to trim and do whatever else is reasonable to alleviate the hazard. (ODOT Maintenance Guide, Chapter 8, page 11, section 8.503.)

Ditch: a facility, typically parallel to the road, which carries storm water runoff draining from the ODOT facility and adjacent properties. It is not a channelized stream, or fish bearing stream.

Emergency: as defined under OAR 125-310-030 and ORS 401.025(4).

OAR 125-310030 "...the emergency consists of circumstances creating a substantial risk of loss, damage, interruption of services or threat to public health or safety that could not have been reasonably foreseen...."

ORS 401.025 (4) "Emergency" includes any man-made or natural event or circumstances causing or threatening loss of life, injury to person or property, human suffering or financial loss, including, but not limited to, fire, explosion, flood, severe weather, drought earthquake, volcanic activity, spills, or releases of oil or hazardous material as defined in ORS 466.605, contamination, actual or imminent loss or restriction of transportation facilities, civil disturbance, riot, sabotage and war."

The distinction must be made as to when the emergency is over and clean up begins. It is during the clean up and permanent repairs that consideration must be given to: disposal of material in approved manner, in approved location; and providing fish passage.

An emergency ends when threats of loss of life, injury, suffering, or financial loss is mitigated and pre-emergency service is restored.

Integrated Pest (Vegetation) Plan: ODOT is required under ORS 634.122 to implement an Integrated Pest Management Program. Integrated Pest Management programs identify the most appropriate method for controlling a pest. For ODOT, the pest being controlled is unwanted vegetation; consequently, ODOT is calling it an Integrated Vegetation Management plan.

Local Disposal Plan: district, or area, wide management strategy or plan for disposing of material generated during emergency and routine maintenance activities.

Maintenance Management System (MMS): a specialized budget and accounting system for managers. The MMS is used for work planning, scheduling, performance evaluation, and budgeting and expenditure control of maintenance activities.

Riparian Management Area (RMA): A classification of management areas for streams and rivers based on their relative size.

SIZE	RIPARIAN MANAGEMENT WIDTHS	EXAMPLES
Large	100 feet	Umpqua River, Sandy River, Willamette River
Medium	70 feet	Little Sandy River, Steamboat Creek, Pudding Creek
Small	50 feet	Most streams (first-second order tributaries)

Routine maintenance: Recurring activities (scheduled or predictable) that are needed to maintain the functional integrity of the existing transportation facility.

Significant Resource Area/Significant Aquatic Resource: Areas that are currently protected, or potentially protected for species. This term applies to areas designated as 'core area' (ODFW); "essential indigenous anadromous salmonid habitat" (DSL); "Type F" streams (ODF); as well as areas to be included in any designated critical habitat for listed species (NMFS, USFWS). This designation also incorporates ODOT transportation corridor proximity: an area will only be designated as a Significant Aquatic Resource if ODOT Maintenance activities have a potential of impacting it

INTRODUCTION

The Oregon Department of Transportation (ODOT) first developed a program to minimize impacts to water quality from routine road maintenance activities in January 1995. A team of maintenance managers, field staff, and environmental staff reviewed maintenance activity for potential impacts to water quality and developed best management practices (BMPs) to minimize those impacts. The review was documented in the 'Oregon Department of Transportation Maintenance Management System Water Quality Guide'. The document was submitted to the Oregon Department of Environmental Quality (DEQ) as part of the ODOT National Pollutant Discharge Elimination System (NPDES) Municipal Separated Storm Sewer System (MS4) permit requirements under the Clean Water Act.

In 1997, a similar team reviewed maintenance activities for impacts to habitat. This review looked at the impacts that specific maintenance activities could have on habitat and fishery resources that are listed as threatened or endangered under the Federal Endangered Species Act. This review was documented in the Oregon Department of Transportation Maintenance Management System Water Quality and Habitat Guide: Best Management Practices, June 1997.

The 1997 document served as the foundation for a Programmatic Biological Assessment on certain ODOT road routine maintenance activities that has evolved into this manual: ODOT Routine Road Maintenance Water Quality Best Management Practices Guide, July 1999. The differences in the two documents are primarily format and refinements. This manual incorporates comments from the National Marine Fisheries Service and provides more thorough descriptions of routine maintenance activities. The 'ODOT Routine Road Maintenance Water Quality and Habitat: Best Management Practices Guide, July 1999' has six key areas:

- Descriptions of maintenance activities with minimization/avoidance actions
- Description of the ODOT training program for routine maintenance and environmental considerations
- Letter of commitment from the agency director
- Description of the process for review, documentation and monitoring implementation and effectiveness of the actions
- Relevant references or examples
- Definitions of terms

In this Guide, words and phrases such as 'where feasible', 'where appropriate' and 'where practicable' are used in conjunction with some minimization or avoidance activities. These phrases, which allow some exercise of professional judgement, are not to be used for convenience or ease of operation. Rather, they are included because ODOT must prioritize its activities in accordance within constraints such as weather, equipment, safety considerations to both the motoring public and ODOT staff, physical/topographical restrictions and state, federal and local laws. Compliance with this Guide means that ODOT staff will use the discretion provided by these phrases where one or more of those constraints make implementation of the full measure impossible.

An ODOT team is developing a decision matrix and process to aid in balancing costs, environmental issues, and safety. This matrix/flowchart will guide designers in project development.

For example, the Guide states that ODOT will "where feasible, schedule sweeping during damp weather, to minimize dust production". ODOT crews strive to follow that. However, debris on the road may require that ODOT sweep the roads regardless of road moisture, to ensure a safe surface. ODOT would then perform the activity as necessary using other applicable minimization/avoidance practices.

Similarly, the Guide indicates "where possible, ODOT maintenance will perform ditch work in optimum weather to minimize environmental impacts..." ODOT will strive to do so. However, where safety of the road requires ditch maintenance regardless of weather and time of year, ODOT will proceed with the maintenance, implementing other applicable minimization/avoidance practices, including erosion control, as required by the Guide.

ODOT has been a committed partner in the Oregon Plan for Salmon and Watersheds. The contribution and input of the ODOT staff, NMFS staff, ODFW staff, and DEQ staff is greatly appreciated.

TRAINING

Understanding and correctly implementing the BMPs for the maintenance activities described in this guide is the responsibility of each of the maintenance personnel. The Oregon Department of Transportation (ODOT) has an extensive outreach/training program for its maintenance personnel on environmental issues. Elements of this program include:

- New employee orientation
- Monthly/Quarterly Manager Team Meetings
- Winter Pass Foremen Annual Meetings
- Annual field visits
- Hazardous materials training
- Erosion and sediment control training
- Fish passage training
- Participation in professional symposiums/conferences
- Videos: The "Road to Recovery: Transportation Related Activities and Impacts on Salmon"; and a new video being made on calcium magnesium acetate (CMA): "CMA: A valuable tool for winter operations and total storm management"
- Continuing Education Classes
- New product trials
- National Pollutant Discharge Elimination System requirements
- Resource agency coordination meetings
- Resource and Restricted Activities Zone maps for district roads

Training continues to be an integral component of ODOT Maintenance. As appropriate courses are identified, these courses will be provided for Maintenance personnel.

DOCUMENTATION/REPORTING

ODOT currently submits a report to the DEQ as part of its Municipal Separated Storm Sewer System (MS4) permit requirements under the Clean Water Act. In addition, ODOT has submitted reports as part of the Oregon Plan for Salmon and Watersheds. These reports have been submitted to the NMFS. ODOT will combine these reports into a single document that reports accomplishments and responsibilities under the Clean Water Act and the Endangered Species Act. Both the National Marine Fisheries Service and the Oregon Department of Environmental Quality will receive copies of the report. Every effort will be made to distinguish in the report the difference between actions that meet the Clean Water Act, and the Endangered Species Act.

In this combined report ODOT will include:

- Investigations of complaints received from/by ODOT staff, other agencies, or members of the public on impacts to the environment by maintenance activities. The documentation will include basis of complaint, results of the investigation, and resolution of issue, or recommendations. (ODOT receives complaints that are the jurisdiction of other agencies, such as DEQ. ODOT passes these complaints on to the appropriate individual.)
- Modifications of, or improvements to, any minimization/avoidance actions including summaries of challenges or successes in applications
- Compliance reviews of construction projects
- Investigations of illicit discharges to ODOT rights of way or drainage pipes
- Overall summary of contacts and coordination with ODFW, NMFS, and USFWS on specific issues

MONITORING

ODOT monitors implementation and effectiveness of best management practices in the course of developing necessary documentation, as well as responding to specific issues.

ODOT may develop research programs, as appropriate, that monitor the effectiveness or impacts of the agency maintenance activities on habitat or water quality. ODOT has monitored the runoff associated with the roads and freeways in the Portland Metropolitan Area, and in the City of Eugene. ODOT is currently partnered with the U.S. Geologic Survey to determine the impact of an ODOT ditch spray program on water and soil quality, and to identify if anti-icing chemicals used during winter maintenance will affect water conductivity. Results of these studies may modify minimization/avoidance measures.

ODOT will document the complaints received from/by ODOT staff, other agencies or members of the public on impacts to the environment by maintenance activities. The documentation will include basis of complaint, results of the investigation, and resolution of issue, or recommendations.

In addition, ODOT will continue to network with other states, agencies, and municipalities on effective monitoring of non-point source pollution.

PROCESS FOR REVIEW

ODOT will utilize the maintenance manager team meetings and the annual field visits to identify and announce any modifications/changes to the minimization/avoidance actions identified in this document. New technologies and design standards will also be presented at the team meetings.

Every five years ODOT will evaluate the need to rewrite the manual. The decision will be made on the number of substantive changes needed and new technologies to be incorporated.

ODOT MAINTENANCE MANAGEMENT SYSTEM (MMS)

Descriptions and Minimization and Avoidance Best Management Practices

Surface Work (MMS 100-110)

Description: Surface and inlay repair includes all repairs of road bases, surface, and shoulder irregularities, including asphalt and concrete surfaces. Asphalt plant production includes production of asphalt for patching materials, staging, moving, stockpiling and setup of asphalt plants.

Minimization and Avoidance

Best Management Practices for surface and shoulder activity types will include:

- Eliminating diesel as a releasing or cleaning agent.
- Using environmentally sensitive cleaning and releasing agents.
- Using heat sources to heat and clean tack nozzles during operations.
- Carrying adequate erosion control supplies (diapers, kitty litter, shovels, etc.) to keep materials out of water bodies.
- Disposing of excess material at appropriate sites, depending upon material being disposed.

Best Management Practices for Asphalt Plant Production will include:

- ODOT will ensure that Contractors and ODOT staff who fuel and operate asphalt plants have an adequate spill plan and materials for spill containment.
- ODOT will establish mixing plants outside of riparian corridors, site location to be approved by the Region Environmentalist/ODOT Biologist, and/or resource agencies.
- If possible ODOT will use commercial asphalt plants for asphalt supply, where economically feasible.
- ODOT will provide areas for truck chute cleanout with proper containment of wet concrete.
- ODOT will protect inlets and catchments from fresh concrete during inclement weather.
- Where possible, ODOT will perform surface work in dry weather, to minimize any runoff of potentially hazardous material.

Shoulder Blading/Rebuilding (MMS 111, 112)

Description: This action includes shoulder blading and rebuilding to correct rutting and buildup of materials, to remove weeds, for safety, and to maintain proper drainage. This activity is similar to ditching, and has similar best management practices. However, it should be considered a different activity than ditching.

Minimization and Avoidance

- ODOT Maintenance will install check dams to protect sensitive resources, when appropriate.

- Specific sites will be evaluated for alternatives to blading, such as berming, curbing or paving shoulder.
- Where practicable, ODOT will evaluate the width of the blading activity and if appropriate, modify the width to minimize disturbance of vegetation.
- Where possible, ODOT Maintenance will blade in dry weather, but while moisture is still present in soil and aggregate (to minimize dust).
- ODOT Maintenance will incorporate this activity into local IVM plans to consider and minimize impacts of this activity on streams.
- Where appropriate, ODOT will permanently stabilize disturbed soils using BMPs (seeding, plants, etc.).

Dust Abatement (No ODOT MMS)

Description: Dust abatement involves application of a dust palliative to non-paved road surfaces to temporarily stabilize surface soils, leading to a reduction of dust during the dry season. Palliatives are applied in liquid form and could include calcium magnesium acetate, magnesium chloride, emulsified asphalts, or lignon sulfonates.

Mitigation and Avoidance:

- During preparation for application of dust palliatives, gravel berms will be constructed at the low shoulders of the roadway to inhibit liquid palliatives from entering waters of the State.
- Dust palliatives will not be applied during rain.
- Methods or materials shall be applied in a matter that is not detrimental to either water or vegetation.
- Carrying adequate spill protection.
- Using environmentally sensitive cleaning agents.
- Disposing of excess materials at appropriate sites.

(NOTE: ODOT does not use dust palliatives. This was included for other transportation authorities wishing to use this document.)

Sweeping/Flushing (MMS 116, 117)

Description: This activity includes sweeping and flushing of roadways, curbs and bridge decks to remove dirt and debris, and scupper (weep holes or direct drains on bridges) cleaning. Materials are recovered (and disposed of) under Activity #117, or sidecast (not picked up) under activity #116. Scupper cleaning involves sweeping of material away from clogged scuppers. Clogged scuppers are normally freed using a steel rod.

Minimization and Avoidance

Best Management Practices will include:

- Use of water (as needed) to reduce dust during sweeping.
- Storage/disposal of removal materials at an appropriate site in an appropriate manner as part of the local material disposal plan. Removed material may be temporarily stored in stable locations to prevent the material from entering wetlands or waterways.
- ODOT Maintenance will recycle sweeping materials where appropriate
- Where feasible, ODOT Maintenance will schedule sweeping during damp weather, to minimize dust production.
- Where feasible, coordinate crews to follow sweeping/flushing with bridge drainage cleaning.
- ODOT Maintenance will remove sweepings produced within 25 feet of identified sensitive spawning areas as identified in coordination with resource agencies, if the design of the facility allows.
- Where appropriate and practical, place sediment barriers in site-specific locations along stream routes or direct drainage routes, to route sweeping material away from watercourse.

Ditch Shaping and Cleaning (MMS 120)

Definition: Ditch: a facility, typically parallel to the road, that carries stormwater runoff draining from the ODOT facility and adjacent properties. It is not a channelized stream, or fish bearing stream.

Description: This action includes use of equipment for cleaning and reshaping of ditches including loading, hauling, and disposing of excess materials. This activity is performed in all weather. Material is removed to an appropriate location for disposal or storage. Vegetation located in the ditch is removed during cleaning.

Minimization and Avoidance:

- ODOT Maintenance will dispose of removed material above the bank line and not in any waterway or wetland.
- ODOT Maintenance will use erosion control devices such as check dams, silt fences, and other acceptable techniques, when the potential exists to have sediment or other materials enter a water of the State.
- ODOT Maintenance will use best management practices identified in the local Integrated Vegetation Management plan.
- ODOT Maintenance will reseed drainage ditches and steep slopes as appropriate. (Ditches functioning as rock fall areas (as determined by the ODOT District Manager), as opposed to drainage facilities will not be reseeded).
- When possible, ODOT Maintenance will perform ditch work in optimum weather to minimize environmental impacts, and consult with ODFW and/or the Region Environmentalist if silt devices are inadequate to filter water prior to draining to watercourses.

- Evaluate and modify, where feasible and appropriate, existing ditch slopes to trap sediments, and support development of vegetation.
- Recycle excavated material when feasible.

This activity may require a section 404 of the Clean Water Act and/or DSL fill removal permit. (See “Flow Chart” Appendix E)

Culvert and Inlet Cleaning (MMS 121), Culvert/Inlet Repair (MMS 123), Miscellaneous Hand/Minor Repair (MMS 129) includes cleaning of detention ponds, swales, pump stations, and wash rack sumps

Description: This action includes clearing of dirt and debris from culvert inlet/outlets to restore function, and repair of damaged passing devices (culverts, siphons, and box culverts, catch basins, drop inlets). Culvert cleaning is done by equipment including backhoe, vactor/jet router (a machine with a high-pressure hose and/or a powerful vacuum), and shovels. Vegetation may be removed during cleaning. Culvert cleaning is done in all weather.

Culvert/inlet cleaning includes removal of beaver dam material that clogs culverts to prevent flooding and culvert failure.

Minimization and Avoidance:

- ODOT Maintenance will install erosion/sediment control during culvert/trash rack cleaning, where erosion control devices can feasibly be installed. ODOT Maintenance will dispose of materials above the bank line and not in any waterway or wetland.
- When and where possible, ODOT Maintenance will perform work at low flow, and may divert flow to minimize turbidity.

Culvert and Inlet Repair

- Any work, which must be performed in flowing water, will be completed during ODFW in-water work period for that system, or as negotiated with ODFW.
- ODOT Maintenance will closely coordinate with ODFW on the removal of material from culvert when work is performed in ODFW identified stream reaches supporting sensitive fish species, or significant, limiting habitat elements.
- Cleaning schedule/methods and repair of culvert/trash racks will be communicated to ODFW (by letter) at least two weeks prior to cleaning, in ODFW identified sensitive areas, such as spawning grounds. Any in-water work will be coordinated with ODFW to ensure no fish stranding occurs, to minimize sediment impacts (except during emergencies) and to clarify in-water work periods in transitional stream reaches.
- Culvert replacement or extension will frequently require permits outside the scope of

this guide, potentially including a U.S. Army Corps of Engineer 404 permit, DSL permit, and other permits. Any culvert replacement or extension may be required to meet provisions for fish passage as required by ORS 498.268 and ORS 509.605. Culvert replacement for culverts identified as requiring fish passage will only occur following guidelines outlined in the ODFW Guidelines: Criteria for Stream and Road Crossings (1996), and in coordination with Region Environmentalist, ODOT Biologist, ODFW or other resource agency.

Tidegate Maintenance

- ODOT will coordinate with the appropriate resource agencies (USFS, ODFW, USACOE) when ODOT maintained tidegates fail or need replacement or removal.
- If possible, ODOT maintenance will inspect and clean structures prior to the rainy season.

Fish ladder maintenance will follow the above minimization measures described for culvert repair and cleaning, including coordination with ODFW, use of erosion/sediment control where feasible, and disposal of material above the bank and not in any waterways or wetlands, or in mutually agreed upon locations. Fish ladder maintenance may occur 1-3 times/year and entails work generally from the banks of the drainage with a backhoe. Additional handwork and weir repair may also be occasionally required. Vegetation may be removed during cleaning.

Erosion Repair (MMS 122)

Description: This action involves repairing water damage to roadways and fillslopes, including import and shaping of material to restore slope and grade lines. In-water work covered by this action could include, but is not limited to, replacement of riprap or rock which have been removed due to bank erosion, gabion baskets, etc.

Minimization and Avoidance

- Any installation of material that exceeds the material removed by bank erosion (below bankfull stage) will constitute a significant action. Increases in the material profile will require additional coordination with regulating agencies, and are not covered in this document. (See Appendix D)
- Replacement of riprap will follow ODFW in-water work periods, in non-emergency situations. Situations which require expedited ODOT Maintenance action, but which are not technically defined as 'emergencies' (under the ESA or by the Division of State Lands (DSL)) will be addressed with ODFW, and potentially the National Marine Fisheries Service/U.S. Fish and Wildlife Service individually.
- Erosion repair work will consider use of bioengineering solutions where practicable. Practicable use areas include areas not shaded by bridge elements, outside of the two-year flood plain where success is probable and safety of the structural elements are assured. (See Appendix D)
- In large riverine systems (e.g. the Umpqua River) where in-water replacement of

riprap is required, ODOT Maintenance will attempt to create barbs to increase backwater areas, where appropriate, practical, and feasible. ODOT Hydraulics and ODFW will be consulted on all barb designs and locations, and ODOT will follow all environmental procedures.

- Any erosion repair activities (responses and cleanup of erosion problems, not the erosive action itself) which causes significant changes in the topography or vegetation within the riparian management area will be coordinated with ODFW and/or regulating agencies.

Best Management Practices will include:

- Disposal of removed material at appropriate sites (stable locations outside the RMA, or if within the RMA, so the material won't be washed into wetlands or waterways)
- Use of erosion control methods in a timely manner, including seeding and mulching specific areas with non-invasive species, installing silt fences and installing other devices as appropriate.
- ODOT Maintenance will take precautionary measures on erodible areas (chicken wire, chain link, rock matting) where eroding areas are identified, and where precautionary measures can be successfully and safely applied.
- ODOT Maintenance will coordinate with ODFW and wetland permitting agencies (US Army Corps of Engineers (USACOE) and DSL) when placing riprap that is in addition to existing conditions and within the two-year floodplain of waters of the State. This activity may require a section 404 of the Clean Water Act and/or DSL fill removal permit. If a DSL permit is needed, the work is outside the scope of this guide (See Appendix D).

Channel Maintenance (MMS 124)

Definition: Channel: a channel is different from a ditch in that a channel is a facility that collects drainage water, can be parallel or perpendicular to the highway facility, and may or may not be a natural stream.

Description: This action includes cleaning and repairing existing channels, including placing riprap to restore and grade.

Minimization and Avoidance

- Installation of new sections of riprap in existing draining systems (i.e. in systems acting as streams) will be considered a significant action, and will not be considered in this document.
- During replacement of significant sections of riprap within drainage channels acting as streams, ODOT will attempt to employ bioengineering solutions where appropriate (stable and not cost-prohibitive).
- Any excess material will be removed from channels after maintenance actions are completed. No material, which could contribute sediment to downstream habitats, will be deposited below the bank or in waterways or wetlands.
- Within the two-year floodplain of systems supporting sensitive fishes, ODOT

Maintenance will perform work during the ODFW in-water work window, or as negotiated with ODFW.

- Cleaning schedule/methods and repairs of channels will be communicated to ODFW (by letter) at least two weeks prior to cleaning, in ODFW identified sensitive areas, such as spawning grounds. Any in-water work will be coordinated with ODFW to ensure no fish stranding occurs, to minimize sediment impacts (except during emergencies) and to clarify in-water work periods in transitional stream reaches.
- ODOT Maintenance will use clean rock sources for channel maintenance.
- ODOT Maintenance will coordinate with ODFW and wetland permitting agencies (US Army Corps of Engineers (USACOE) and DSL) when placing riprap that is in addition to existing conditions and within the two year floodplain of waters of the State. This activity may require a section 404 of the Clean Water Act and/or DSL fill removal permit. (See Appendix D)

Fish Restoration (No ODOT MMS)

Description: This is any ODOT work that involves planting vegetation along a stream corridor (e.g. slope stabilization, replanting of removed vegetation). Any ODOT work that incorporates bioengineering into existing riprap or any ODOT work that modifies an existing drainage ditch for better water-quality control (no major construction is involved).

Minimization/Avoidance:

See Ditch Shaping and Cleaning (#120)

See Erosion Repair (#122)

Fish Betterment (No ODOT MMS)

Description: This work includes installation in culverts of baffles or weirs for fish passage, construction of berms, or detention facilities, installation of deck curbs, new culverts or jump pools for fish passage.

Minimization/Avoidance:

See Culvert and Inlet Cleaning, Culvert/Inlet Repair, Miscellaneous Hand/Minor Repair (#129)

Bridge Maintenance (MMS 160, 163) Other Structure Maintenance (MMS 169)

Description: This is a large category of ODOT Maintenance actions. There are two major categories: drift removal and maintenance of bridges and large (over six feet diameter) culverts.

Drift removal involves either using boats to maneuver the drift, hydraulic tongs to reach over the side of structure and dislodge the material, or pulling the drift from the side of

the bridge (bank) and cutting it into pieces.

Maintenance and replacement of structures includes washing, painting, scraping and patching of curbs, rails, deck joints, on wood, concrete and steel bridge components. Pesticides are applied to bridges occasionally.

Minimization and Avoidance

- All work within the flowing channel of any aquatic system will be performed during the appropriate in-water work window for that system, or as negotiated with ODFW (except when there is imminent danger to life, limb, or structure).

Drift Removal

- ODOT Maintenance will cut (only when necessary) and turn drift to allow it to flow through and under the structure, where doing so would not endanger any other crossing structures downstream.
- ODOT Maintenance will repair and restore riparian areas temporarily impacted by machinery during drift removal. Long-term access for drift removal will be coordinated with ODFW.

Bridge Cleaning/Maintenance

- The Clean Water Act and the NPDES (as regulated by the DEQ) regulate hazardous materials entering waters of the State. DEQ has stated that adequate measures, to the 'maximum extent practicable' will be taken in maintenance activities to ensure that paint and other hazardous material does not enter waters of the State. These avoidance measures, if followed, will be sufficient to avoid impacts to sensitive salmonids. ODOT Maintenance will coordinate guano removal and any other specific concerns with DEQ.
- While performing maintenance on bridge structures (above water), reasonable attempts, to the maximum extent practicable, will be made to keep material from falling from the structure into the water. Any material which does fall into the water will be removed (if possible) in the least destructive way possible, or left in place if this would be less destructive to fisheries habitat (See Appendix C).
- ODOT Maintenance will temporarily block deck drains over streams and scuppers over streams when pressure washing, sandblasting, or scraping structures, to route water off deck and into vegetated areas where practicable.
- ODOT Maintenance will remove debris from bridge decks in a manner that minimizes material entering waterbodies. Preferred methods may include removal of large debris from bridge decks with a sweeper or a shovel. Other material may be scraped by hand before being collected, removed (prior to pressure washing). Material will be disposed of as identified in the local Material Disposal Plan.
- ODOT is developing a policy to eliminate drainage systems that drain directly to streams where physically possible (See Bridge Office Practices Manual and Appendix F).

Bridge Repair (MMS 162)

Description: This includes repair of bridges and large culverts (over six feet diameter). In- water bridge repair can include repair or replacement of riprap, drainage features, and catch basins and replacement of structural members.

Minimization and Avoidance

- Bridge repair work that requires installation of riprap will consider use of bioengineering solutions, where practicable. "Practicable" use areas will include areas unshaded by bridge elements, above the full bank stage where success is probable and safety of the bridge structure is assured.
- Bridge structural repairs that require in-water work will be independently coordinated with ODFW and/or the Region Environmentalist and the responsible Engineer to minimize impacts. These contacts will determine whether or not the action will require significant modification of the aquatic system and thus require a Biological Assessment and consultation with NMFS/USFWS. In-water work may include permanent impacts, such as placing riprap, or temporary impacts such as installing falsework or stream access.
- ODOT Maintenance will coordinate with ODFW wetland permitting agencies (US Army Corps of Engineers (USACOE) and DSL), and other appropriate environmental regulators when placing riprap that is in addition to existing conditions and within the two year floodplain of waters of the State.
- ODOT Maintenance will coordinate with ODFW (where and when necessary) to divert water away from concrete work areas during structural repairs of bridges and culverts.
- When repairing drainage features ODOT, will make every attempt (within the engineering solution) to incorporate fish passage solutions and enhancements, such as adding roughness (by adding cobble) in coordination with the Region Environmentalist and/or ODFW, and ODOT Hydraulics.
- ODOT Maintenance will perform any in-water work within ODFW in-water work window, or in time frames negotiated with ODFW (See Appendix C).

Best Management Practices for bridge repair will include:

- Placing refuse material above the bank, away from waterways and wetlands.
- Ensuring that the active flowing stream will not come into contact with fresh, plastic concrete.
- Disposing of material in locations and manners identified in the local disposal plan.
- Providing a stable, appropriate concrete truck chute clean-out area and requiring the contractor to use it, to keep material from being deposited in riparian corridors.
- Using cofferdams for structural repairs as appropriate.
- Containing saw chips where feasible.
- Avoiding use of creosote or "Penta" treated wood for permanent structures.

VEGETATION MANAGEMENT

ODOT implemented an Integrated Pest Management Program as required by ORS 634.660. An Integrated Pest Management program identifies the most appropriate method for controlling a pest. For ODOT, the “pest” being controlled is unwanted vegetation, consequently, ODOT prefers the term Integrated Vegetation Management (IVM). IVM methods typically involve:

- Mechanical: using equipment such as mowers, chain saws, brushers, etc.
- Biological: using a natural predator to control the pest (flea beetle or Cinnabar Moth to control tansy ragwort, for example)
- Cultural: incorporating native, or more appropriate, plant material to out-compete the pest
- Chemical: applying appropriate chemicals

In the past two years, ODOT has required each of its maintenance districts to develop an IVM plan for vegetation management. Each plan typically includes:

- Goals and objectives for IVM
- Maps of roads and management zones
- Methods (in some cases by mile point) to be used to control vegetation
- Reports
- Best Management Practices

ODOT incorporates routine maintenance activities into the IVM program.

Definition of Danger Tree: Trees or snags, on or near the highway that are found to be weakened, unsound, undermined, leaning, or exposed so they may fall across the highway. When permission to remove the trees cannot be obtained, it is necessary to trim and do whatever else is reasonable to alleviate the hazard. (ODOT Maintenance Guide, Chapter 8, page 11, section 8.503.)

Mowing (MMS 130), Brush Mowing (MMS 132), Brush Cutting (by hand) (MMS 133)

Description: These actions are designed to restore sight distance, reduce ice (due to shading) and to control/prevent slope failure. These actions involve mechanical mowing, trimming, removal of brush and cleanup.

Minimization and Avoidance

- No alterations to the mowing policy will be necessary to avoid impacts to fish. Local Integrated Vegetation Management Plans identify mowing areas, and are designed to minimize impact to receiving waters while still maintaining grassed areas.
- Cut brush, in riparian areas, will be left in place where doing so does not interfere with sight distance, create safety issues, cause fire hazards, involve noxious weeds or the proper functioning of highway features (e.g. drainage).
- ODOT Maintenance actions will limit mowing to no more than 8 feet off edge of pavement in significant resource areas, unless needed to maintain proper functioning of highway features (e.g. drainage).

- ODOT Maintenance will maintain shade trees along streams and rivers, unless those trees are danger trees (as determined by ODOT Forester and/or appropriate resource agency), could potentially impact bridge structures, or could impact line of sight. If trees provide shade or bank stabilization within 50 feet of streams and are determined to be danger trees that must be removed, tree removal will be coordinated with ODFW or other regulatory agency.
- Only brush within 20 feet (on either side) of and under all bridge structures will be removed. All other brush not within ODOT's clearzones will be left in its current condition, unless the brush interferes with sight distance, shades the structure, or the brush is a noxious weed (e.g. scotch broom). Mapping of sensitive resource areas may lead to additional areas not being brushed.
- On culverts 6 feet or greater, ODOT Maintenance will remove 10 feet of brush on both sides of the culvert, on the upstream end of the culvert and 10 feet on both ends on the downstream side, unless the brush around the culvert is a noxious weed. If other brushing needs are identified, ODOT will coordinate with ODFW.

When removing mature trees (over 12-inch (30cm) diameter at breast height (dbh)) in riparian areas, ODOT will replant two seedling/cuttings for every tree removed. ODOT will coordinate with ODFW on species and location of trees to be replanted within the same watershed. ODOT will ensure that the replanted trees will not pose a future threat to ODOT structures.

Spraying (MMS 131)

Description: This action consists of spraying chemical to control the growth and spread of noxious weeds and brush. ODOT Maintenance does not use any restricted-use chemicals to control vegetation. Herbicides used include broad-based foliar-active herbicides and soil residual herbicides.

Minimization and Avoidance

- ODOT Maintenance follows an Integrated Vegetation Management program. The local IVM Plan maps locations of sensitive natural resources and identifies areas where spraying does not occur. The local IVM Plan includes protection of sensitive fish species. The herbicide spray program may include modification of spray times and modifications of spray widths to protect riparian areas. Specific minimization/avoidance measures will be developed on a site-specific basis.

Best Management Practices will include:

- ODOT Maintenance will eliminate spray activities on structures located over streams or adjacent to wetlands.
- ODOT Maintenance will use chemicals approved for use near aquatic resources, or as directed by regulators.
- Herbicides will be used in accordance to EPA labels.
- Within riparian areas, ODOT Maintenance will hand spray around structures over water that require chemical vegetation control.

- Within 25 feet of riparian areas, ODOT will boom spray no further than eight feet from the edge of pavement.
- Within 25 feet of an active, flowing stream, ODOT will stop all boom spraying.
- Where computer-assisted spray trucks are owned, they will be utilized. Computer assisted spray trucks can manipulate the mixture and rate sprayed, and can stop and start spray activities to avoid impacting individual creeks.

Bridge Vegetation (MMS 160, 133)

Description: This includes vegetation management around existing bridges. The primary purpose of bridge vegetation management is to maintain sight distance. Bridge vegetation management must also maintain access to the bridge structure for structure maintenance, fire safety, and to maintain the integrity of the structure.

Minimization and Avoidance

- ODOT Maintenance will normally only remove brush to 20 feet on either side and under all maintained bridges for access or repair. (In some instances, road access under or adjacent to the structure will be outside the 20 foot buffer).
- Only brush necessary to perform the activity will be removed.
- When removing mature trees (over 12-inch (30cm) dbh) in riparian areas, ODOT will replant two seedling/cuttings for every tree removed. ODOT will coordinate with ODFW on species and location of seedlings/cuttings to be replanted within the same watershed. ODOT will ensure that the replanted trees will not pose a future threat to ODOT structures.

Other Vegetation Management (No ODOT MMS)

Description: The ODOT Forester, and/or resource agency staff (such as State Forestry, US Forest Service), identifies and ODOT Maintenance removes danger trees (see page 16 for definition). ODOT Maintenance also removes trees from forested areas, which are weighting unstable slide areas, and where the trees or slide have the potential to reach the highway. ODOT Maintenance also occasionally removes trees, which threaten to fall, and in the falling or uprooting, remove large portions of bank area.

Minimization and Avoidance

- Where possible, ODOT Maintenance will attempt to maintain buffer strips corresponding to these Riparian Management Areas

SIZE	RIPARIAN MANAGEMENT WIDTHS	EXAMPLES
Large	100 feet	Umpqua River, Sandy River, Willamette River
Medium	70 feet	Little Sandy River, Steamboat Creek, Pudding Creek
Small	50 feet	Most streams (first-second order tributaries)

- ODOT Maintenance will maintain shade trees along streams or rivers unless those trees are “danger trees” as described above. If trees provide shade or bank stabilization, are within 50 feet of streams, and are determined to be danger trees that must be removed, the trees will be removed in consultation with ODFW.
- Prior to removing trees within an RMA to reduce weight on a failing slope, coordination will be performed with the Region Environmentalist, ODFW, and/or the appropriate regulatory agency. Removal of many trees from streamside areas will require a replanting and erosion control plan. Significant consideration will be given to retaining trees, which provide stream shading (e.g. within 50 feet of the active channel).
- Permanent solutions to chronically unstable areas will be pursued through the project development process. Solutions could include artificial hillside drainage or permanent shoring.
- When removing mature trees (over 12-inch (30cm) dbh) in riparian areas, ODOT will replant two seedling/cuttings for every tree removed. ODOT will coordinate with ODFW and/or the Region Environmentalist on species and location of seedling/cuttings to be replanted within the same watershed. ODOT will ensure that the replanted trees will not pose a future threat to ODOT structures.

Accident Clean up (MMS 149)

Description: This action includes removal of accident debris, and may include response to hazardous spills. Upon knowledge of an incident, ODOT Maintenance’s prioritized responsibilities consist of 1) maintenance of public safety 2) ensuring through DEQ, contractors or other responsible parties that the appropriate cleanup is properly performed as identified in local accident response procedures.

Guardrail Replacement (MMS 151)

Description: This activity involves repair and replacement of existing guardrail sections.
Minimization and Avoidance

- In unstable situations, areas downslope from guardrail replacement will be protected with erosion control measures (silt fences and other appropriate devices) where appropriate to minimize additional sediment loadings into aquatic systems.

Attenuator Maintenance (MMS 153)

Description: This activity includes service, repair, replacement, and realignment of damaged attenuators (physical systems that are strategically placed along exit ramps, bridge abutments, etc. to minimize impacts and cushion vehicles). Following impact, attenuators compact, releasing fluid (often ethylene glycol) which can flow directly to drainage systems.

Minimization and Avoidance

- ODOT Maintenance will use non-chemical systems when installing new attenuators.
- When replacing attenuators, ODOT will install those devices found to be the most environmentally sound.
- ODOT Maintenance will use absorbent dams or diapers around attenuators during repair or maintenance.
- ODOT Maintenance will identify and close inlets (if appropriate and can be done safely) during attenuator maintenance.

Snow and Ice Removal (MMS 170) and Sanding (MMS 171)

Description: Snow/ice removal consists of plowing snow and ice from bridges, roadways, and shoulders. Sanding activities put sand on road and bridge surfaces to provide for safer driving surfaces. Calcium magnesium acetate (CMA), potassium acetate and magnesium chloride are applied as anti-icers, to prevent water from bonding to the pavement. Winter weather will determine rates of application for sand and anti-icers and de-icers. ODOT recycles sanding material into shoulders. ODOT crews estimates that anywhere from 10-50% of the sand applied is re-used or trapped. The majority of the sand is removed from the road by plows, up to 60 feet off the road. ODOT captures sand around bridges, and near streams where possible.

Minimization and Avoidance

- ODOT Maintenance develops winter management and operation plans that identify critical areas, levels of service for roads and methods for maintaining levels of service during winter weather.

Best Management Practices include:

- Reducing application rates of sand
- Using CMA on bridges and roads where permitted and during freezing fog in lieu of sanding, when optimum conditions exist, where adjacent water bodies support a 100:1 dilution factor or there is a vegetative buffer between the road and water body and where there is no standing, shallow water.
- Placing barriers in site specific locations where appropriate and practical, along streams or direct drainages to route sanding/anti-icing material away from watercourses.
- Reducing plowing speed in sensitive areas.
- Stopping sidecast sweeping within 50 feet of structures over water, where structurally possible.
- Identifying and creating facilities to capture sanding material where appropriate.
- Reducing quantity of sand applied where appropriate.
- Cleaning inlets prior to first rain as feasible.
- Modifying blade angles or blower hoppers in sensitive areas.
- Educating ODOT Maintenance staff on water quality and fishery resource issues.

- ODOT Maintenance will be limiting the use of magnesium chloride over the next year to certain geographic areas, and within two years is expected to eliminate the use completely.

(NOTE: manufacturers and distributors are working on providing impartial documentation on the environmental impact of magnesium chloride. ODOT reserves the right to use magnesium chloride if environmental clearances by regulators and engineers are obtained.)

Emergency Maintenance (MMS 180)

Description: This action includes fixing damage to roadways, the roadside and structures (bridges) caused by storms, floods, and other activities. These actions may not be technically defined as an emergency under the Endangered Species Act (Presidential declaration), however, failure to perform these activities may result in immediate threat to life, limb or structures (See Appendix G).

Minimization and Avoidance

- ODOT will provide quick response and first inspection, and notify appropriate resource staff in a timely manner.
- In coordination with ODFW and/or Region Environmentalist, ODOT Maintenance will repair any damage to fishery or water resources caused by ODOT Maintenance responses to the emergency.
- ODOT Maintenance will avoid additional impacts to wetlands or streams where possible.
- ODOT Maintenance will provide, if possible, adequate erosion control or bank stabilization necessary to keep material from entering watercourses.
- ODOT Maintenance will identify and plan for slide debris disposal sites as part of local disposal plans. Appropriate sites for long and short-term material disposal will be identified and cleared for any potential wetland or sensitive species impact and mapped.
- Remedial actions for emergencies will include bioengineering and fish friendly designs, where practicable for stability and safety.

Settlements and Slides (MMS 181)

Description: This action includes repair of settlements and slides by placing fill and removing material. Settlement/slide repairs are done primarily when a road is in danger of collapse, and to forestall an emergency.

Minimization and Avoidance

- Emergency Maintenance (#181) and Erosion Repair (#122) Minimization/Avoidance actions will be followed. Environmental clearances may be required.

Extraordinary Maintenance (MMS 189)

Description: This activity includes work, which is extraordinary, but not specifically identified as a separate activity. Examples include: military operations, forest and other fire response, cleaning benches and moats, ice floes, transient housing control and cleanup, slides and sumps, and broken water line repair and cleanup.

Minimization and Avoidance

- ODOT Maintenance will practice sound housekeeping activities to ensure sediment and other materials do not enter watercourses.
- ODOT will repair any damage to fish habitat caused directly by ODOT actions.

Stockpiling (MMS 190)

Description: Stockpiling materials for ODOT Maintenance activities.

Minimization and Avoidance

- ODOT will develop site plans for areas adjacent to or near riparian areas to identify erosion and sediment control needs, and to ensure stability of the material.
- Sites will be identified as part of the local disposal plan.

APPENDICES:

- A: Guidelines for Maintaining Water Quality in Snow & Ice Operations
- B: Oregon Dept. of Fish & Wildlife Guidelines & Criteria for Stream-Road Crossings
- C: Oregon Guidelines for Timing of In-Water Work to Protect Fish & Wildlife Resources
- D: Figure 1 - DSL Fill/Removal Permit Cross Section
- E: Guidance for Maintenance Activities in Wetland Ditches
- F: Guidelines for Bridge Washing
- G: Guidance for Emergency Highway Repair

APPENDIX A

Guidelines for Maintaining
Water Quality In Snow and
Ice Operations

GUIDELINES FOR MAINTAINING WATER QUALITY in SNOW & ICE OPERATIONS

GENERAL CONCERNS FOR ALL CHEMICALS & SAND

APPLICATION: Snow and ice control chemicals and sand should be applied at the least rate that is consistent with environmental, meteorological, and traffic conditions.

STORAGE: Sand and chemicals should be stored in a manner to minimize any contamination of surface or ground water. Care should be taken to prevent runoff from chemical tanks or chemical treated stockpiles. Covered storage for dry chemicals is preferred.

CONTAMINANTS: Chemicals and sanding materials should be free of contaminants known to cause water quality problems. Some of these include:

Arsenic	Barium	Cadmium	Chromium
Fluoride	Lead	Mercury	Nitrate
Selenium	Other heavy metals		Hydrocarbons

INVENTORY: Inventory all known runoff receptors.

DOCUMENTATION: Careful records of chemical and sand application are necessary to determine both short and long range effects. All use of sand and chemicals should be continuously and accurately recorded.

CRITICAL AREAS: Receptors that have any of the following attributes should be reviewed with natural resource agencies for special consideration:

1. spawning streams and those inhabited by protected aquatic species, especially salmon & trout;
2. those receiving direct runoff from treated roads & highways where there would be less than 100:1 dilution;
3. those where a large volume of highway runoff can directly reach small, poorly flushed ponds, lakes and wetlands;
4. those where receiving water temperatures have warmed by the time highway runoff arrives;
5. those areas where shallow ground water is overlain by very coarse and permeable soils; and,
6. drywells, French drains, or similar facilities that allow surface water access to underground aquifers.

GUIDELINES FOR MAINTAINING WATER QUALITY in SNOW & ICE OPERATIONS

SPECIFIC USAGE GUIDELINES:

SAND: Sanding materials or abrasives are not without environmental impact. The following are some areas where careful review of the use of sand is indicated:

1. those with PM₁₀ (dust) related air quality problems;
2. those where there is danger of siltation in spawning streams, shallow lakes or ponds;
3. those that have sensitive, rare plants near the roadside; and,
4. those where sand is considered to have a negative impact on esthetics.

CMA and KA: The use of calcium magnesium acetate (CMA) and potassium acetate (KA) is to be tightly controlled or possibly avoided in the following areas:

1. those where receiving waters will not provide 100:1 dilution during the runoff season, or if the runoff occurs in the late season when the receiving waters may have warmed and protected aquatic species are present;
2. those where a larger highway runoff volume can directly reach a small, shallow pond, lake, or wetland, particularly if the receptor is ice covered. A 30 foot vegetation buffer may be adequate;
3. those where there is no vegetation buffer between the road and receiving waters, and the waters should be protected from oxygen depletion. Present ODOT standards for vegetation buffers is adequate;
4. those where known to have heavy metal concentrations, coarse soils overlying sensitive aquifers, or percolation devices such as French drains and drywells:

When CMA or KA is used in any of the above situations due to over riding concerns for highway safety, water quality should be carefully monitored for possible problems.

MgCl₂: The use of magnesium chloride (MgCl₂) is limited to experimental use only.

APPENDIX B

Oregon Department of Fish and Wildlife
Guidelines and Criteria for
Stream-Road Crossings



OREGON DEPARTMENT OF FISH & WILDLIFE GUIDELINES AND CRITERIA FOR STREAM-ROAD CROSSINGS

Authority

ORS 498.351 and ORS 509.605, et al, require any person, municipal corporation or government agency placing an artificial obstruction across a stream to provide a fishway for anadromous, food and game fish species where these are present. Fish passage accommodations will be required on any stream, regardless of size, perennial or intermittent, if it is utilized by fish during any significant period of the year. In addition, ODFW may recommend fish passage accommodations at structures constructed in any stream that has a history or potential for fish production if applicable ODFW Basin Fish Management Plans call for the establishment or re-establishment of these populations.

A local Oregon Department of Fish and Wildlife (ODFW) representative should be contacted to determine fish presence and identify fish passage needs at proposed road-waterway crossing projects if such is in question. Project proponents should assume that accommodations for fish passage will be required at any road crossing regardless of stream size if no determination is requested.

Although it is the landowner's responsibility to install and maintain required fish passage structures, it is the policy of ODFW to provide assistance on request to the extent possible. Generally, proposed designs should be reviewed by ODFW prior to finalization of project plans.

Fishway Design: Philosophy, Theory and Practice

When designing fish passage facilities, the following biological variables should be considered:

- Species of fish present
- Life stages to be impacted
- Migration timing of affected species/Life stages

The local ODFW district biologist may be contacted for this information.

Fish passage design is normally based on the weakest species or

life stage present that requires upstream access and should accommodate the weakest individual within that group. Management objectives and other relevant factors may, however, direct deviation from this standard. For instance, passage needs of undesirable species (e.g., brook trout in bull trout habitat) may not be accommodated based on other over-riding management objectives. Also, if juveniles, generally the weakest life stage of a species, would use habitat above a culvert for an insignificant portion of the year, ODFW may conclude that only spawning fish (stronger adults) need to be accommodated and that the culvert need not be designed at the higher (juvenile) standard.

Conventions

As used in these discussions of standards, designs and criteria, the "entrance" and "exit" of a culvert or fishway is from the fish's perspective as it moves upstream. Thus, the "entrance" refers to the downstream portion of the structure while the "exit" is the upstream end. "Inlet" and "outlet" refer to water entering and leaving a culvert or fishway.

Hydrologic Considerations and Calculations

It is not considered necessary or practical to design culverts to pass fish at flood stage or continually. Fish generally move after flood peaks pass. Acceptable hydraulic design of culverts includes selection of appropriate design flow from which the flow characteristics can be derived by hydraulic analysis. The low flow depth design should be based on the 2-year, 7-consecutive-day low flow discharge or the 95% exceedence flow for the migration period of the fish species of concern. The high flow design discharge should be the flow that is not exceeded more than 10% ($Q_{10\%}$) of the time during the months of adult migration. That flow can be approximated by

$$Q_{10\%} = 0.18 \times (Q_2) + 36$$

for cases where the 2-year flood event (Q_2 ; in cfs) is greater than 44 cfs. For cases where Q_2 is less than 44 cfs, the design flow can be approximated as equaling Q_2 .

Criteria for Upstream Movement of Adult Fish

Adult anadromous fish generally expend approximately 80% of their stored energy reserve during normal upstream migration to suitable spawning areas. Undue exertion or delay at stream-road crossings due to unsuccessful passage attempts at inadequate (blocking) structures can lead to reduced spawning success and

pre-spawning mortality.

Where fish passage is required by ODFW (in general, wherever fish are present), the following guidelines shall be utilized for preliminary design. Design flows for culvert passage are calculated based on monthly periods when fish migrate.

Maximum Water Velocities

Table 1: Average Water Velocity (fps) at High Flow Design Discharge for:

Culvert Length (ft)	Salmon & Steelhead	Adult Trout (>6")	Juvenile salmonids
Under 60'	6.0	4.0	2.0
60 to 100'	5.0	4.0	2.0
100 to 200'	4.0	3.0	see note below
200 to 300'	3.0	2.0	see note below
over 300'	2.0	1.0	see note below

Note: For juvenile fish, only designs incorporating streambed simulation solutions will be considered for culverts over 100' in length. "Streambed simulation" refers to the situation where substrate and flow conditions in the crossing structure mimic the natural streambed above and below the structure.

Table 1 presents the hydraulic criteria for the design of culverts for passage of salmonids. Satisfaction of these criteria is essential to the adequacy of a culvert installation to meet fish migration needs. These criteria are based on several references.

In a natural stream channel, the average water velocities indicated in Table 1 are often exceeded. The diversity of natural channel beds and formations, however, provides paths of access with suitable depths, velocities and resting opportunities with only brief exposure to excessive conditions. Velocity requirements noted above may be exceeded within structures with natural beds upon approval by the ODFW Fish Passage Coordinator, Portland.

Minimum Depth at Low Flow Discharge

For non-embedded culverts, minimum water depth during expected

fish passage periods shall be:

- Twelve (12) inches for adult steelhead and chinook salmon;
- Ten (10) inches for salmon other than chinook, sea-run cutthroat trout and other trout over 20 inches in length; and
- Eight (8) inches for trout under 20 inches, kokanee and migrating juvenile salmon and steelhead.

For embedded (stream simulation) culvert designs, minimum depth at low flow discharge during expected fish passage periods must meet or exceed conditions found in the adjacent natural channel.

Entrance Jump; Maximum Vertical Height

A backwatered or partially submerged culvert entrance is preferred but the following maximum jumps are allowable where justified:

- One(1) foot for salmon and steelhead adults
- Six (6) inches for trout and kokanee adults and salmon and steelhead juveniles.

The above are also the maximum jump heights when a series of jumps and pools are required.

In cases where entrance jumps are planned, a jump pool of at least 1.5 times the jump height or a minimum 2 feet deep must be provided.

When planning for any jump into a culvert, project designers must show why the culvert could not be designed with no jump.

Criteria for Upstream Migration of Juvenile Salmonids

Upstream juvenile migration occurs in response to instream habitat conditions, predation and population pressures. Juvenile migration and redistribution is a means for increased survival and optimizing production. An obstruction to juvenile migration can limit production both upstream and downstream from the barrier.

Juvenile salmonids, by virtue of their small size, are less capable swimmers when compared to adults. Therefore, maximum water velocity, jump and swimming distance criteria are necessarily lower than those for adults.

Preferred Road-Stream Crossing Structures

Where fish passage facilities are required by ODFW, the following

structure types shall be considered for use in the displayed order of preference:

1. Bridge (with no approach embankment into the main channel)
2. Streambed simulation strategies using a Bottomless Arch or embedded culvert designs
3. Streambed simulation strategies using embedded round metal or concrete box culvert designs
4. Non-embedded culvert; placed at less than 0.5% slope
5. Baffled culvert (various designs); placed at 0.5% to 12% slope or a structure with a fishway.

Again, streambed simulation refers to the situation where substrate and flow conditions in the crossing structure mimic the natural streambed for fish passage flows.

The landowner or agency must justify their proposed structure type if a more preferred structure type is not selected.

General Considerations

At any given flow, slope is an important factor affecting water velocity in culverts. Culvert size also affects velocities, especially when a structure is considerably undersized and a head (pooling above culvert) is developed.

Gradients (slope) for non-embedded, non-baffled culverts shall not exceed 0.5% unless a tailwater situation exists to backwater the culvert to a suitable depth for its length. Properly baffled or weired culverts are appropriate for steeper gradients depending on design. Structures with fishways (i.e., fish ladders or culverts with weir-type baffles) generally will be required where culvert gradients exceed 5% and streambed simulation is not employed.

Corrugated metal culverts are generally preferred over smooth-surfaced culverts. Deep corrugations are preferred over shallow corrugations.

Bottomless arches and all styles of embedded culverts shall be placed at or near the same gradient as the natural streambed and shall be at least as wide as the active stream channel (i.e., no lateral encroachment on the active stream channel). All embedded culverts (round or arch) must be embedded one foot deep or at least 20% of its height, whichever is more.

When deciding between bottomless arch and embedded culvert designs, the primary consideration is foundation substrate. If considerable bedrock is present, an open bottom arch is generally the appropriate choice; embedding a culvert would require

extensive excavation. Where deep unconsolidated gravel and cobble is present, failure (undermining) of a bottomless arch foundation is a major concern.

Hydraulic controls may be required to (1) improve culvert entrance and exit conditions (e.g. using a beveled inlet configuration; providing resting pools at culvert entrance and exit), (2) concentrate low flows, (3) prevent erosion of stream bed and banks, or (4) allow passage of bedload material. The need for, and design of, these project features should be developed in consultation with ODFW.

If water-crossing structures are placed in spawning areas, they must incorporate mitigation measures, as necessary, to achieve no-net-loss of spawning area.

Trash racks are discouraged at culvert inlets. But if necessary, these should be installed only above the high passage flow water level.

For culverts over 200 feet in length, illumination may be required. Contact the ODFW Fish Passage Coordinator, Portland, for a case-specific determination.

Water Crossing Structures

Bridges

Properly installed bridges pose the least impact on crossed water courses and are, therefore, generally preferred by ODFW. Bridges are appropriate at any stream gradient. It is understood that bridging costs can be relatively high and that project costs is a valid consideration when evaluating road-stream crossing alternatives.

Culverts

Where fish are present and passage is a concern, culverts shall be designed and constructed to provide adequate fish passage (as per criteria stated herein) for those species and Life stages determined to be present. High water velocity, shallow water depth within the culvert, excessive vertical drop at the culvert outlet and debris blockages are the most frequent causes of fish passage problems at culverts. Therefore, culverts must be designed and constructed to avoid these defects.

Culverts may be approved for placement in small streams without extensive hydraulic analysis if placed on a flat gradient (0.5% or less) and achieve minimum depth requirements. Where culvert installation is not feasible at a flat gradient, the culvert

design shall consider design criteria outlined earlier.

Construction Considerations and Conditions

Culverts and associated fill should be designed using standard engineering design practices to maintain structural integrity to the 100-year flow.

Disturbance of the bed and banks should be limited to that necessary to place the culvert, embankment protection and any required channel modification associated with the installation. All disturbed areas should be protected from erosion within seven (7) calendar days of completion of the project using vegetation or other means. The banks should be revegetated within one year with native or other approved woody plant species. Live stakes should be planted at a maximum interval of three feet (on center) and maintained as necessary to ensure 80% survival.

Approved structures should be constructed in the dry whenever possible. Where significant live flow exists, isolation of the construction site from stream flow is required by techniques such as:

- ▶ the installation of a bypass channel, a flume or culvert
- ▶ the installation of a sheetpile or sandbag wall
- ▶ the use of a water-filled cofferdam
- ▶ by pumping the stream flow around the site

Exception may be granted if siltation or turbidity is reduced to acceptable levels by means approved by ODFW.

Any fish stranded in the construction area or diversion reach shall be safely moved to the flowing stream. A local ODFW representative should be contacted to determine if the fish need to be moved.

Any wastewater from project activities and dewatering shall be routed to an area outside the ordinary high water line to allow settling of fine sediments and other contaminants prior to being discharged back into the subject stream.

If in-water excavation is anticipated, timing of same shall conform to *Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources* unless an exception is approved by ODFW.

file: rdxing2.wpd

APPENDIX C

Oregon Guidelines for
Timing of In-Water Work
To Protect Fish and
Wildlife Resources



OREGON GUIDELINES FOR TIMING OF IN-WATER WORK TO PROTECT FISH AND WILDLIFE RESOURCES

January, 1997 - v.01

Purpose of Guidelines - The Oregon Department of Fish and Wildlife, (ODFW), under its authority to manage Oregon's fish and wildlife resources has updated the following guidelines for timing of in-water work. The guidelines are to assist the public in minimizing potential impacts to important fish, wildlife and habitat resources.

"The guidelines are to assist the public in minimizing potential impacts..."

Developing the Guidelines - The guidelines are based on ODFW district fish biologists' recommendations. Primary considerations were given to important fish species including anadromous and other game fish and threatened, endangered, or sensitive species (coded list of species included in the guidelines). Time periods were established to avoid the vulnerable life stages of these fish including migration, spawning and rearing. The preferred work period applies to the listed streams, unlisted upstream tributaries, and associated reservoirs and lakes.

"The guidelines are based on ODFW district fish biologists' recommendations"

Using the Guidelines - These guidelines provide the public a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife, and habitat resources. ODFW will use the guidelines as a basis for commenting on planning and regulatory processes. There are some circumstances where it may be appropriate to perform in-water work outside of the preferred work period indicated in the guidelines. ODFW, on a project by project basis, may consider variations in climate, location, and category of work that would allow more specific in-water work timing recommendations. These more specific timing recommendations will be made by the appropriate ODFW district office through the established planning and regulatory processes.

"These guidelines provide the public a way of planning in-water work during periods of time that would have the least impact on important fish, wildlife and habitat resources"

Modification of Guidelines - There may be limited situations where minor modification of the timing guidelines is warranted. ODFW may consider new information, the need for greater detail, or other factors that would generally improve the quality and usefulness of these guidelines. ODFW through the appropriate district office may modify or clarify timing guidelines within the district as needed. Statewide updates to guidelines will occur on a periodic basis.

"ODFW through the appropriate district office may modify or clarify timing guidelines within the district as needed"

Public Comments - A limited technical public review of these updated guidelines was conducted. A few responses provided specific biological information and recommendations for changing in-water work periods. Applicable ODFW districts reevaluated their timing recommendations based on this public response. Other comments concerned format and application of the timing guidelines. Some responses stated that different types of in-water activities should have different timing guidelines. ODFW recognizes there will be occasions that more specific timing guidelines may need to be established for specific activities. The established planning and regulatory processes can accommodate that need.

"A limited technical public review of these updated guidelines was conducted"

Columbia Region

North Coast District

WATERWAY	PREFERRED WORK PERIOD ¹
<u>Columbia Region</u>	
<u>North Coast District - Astoria Office - (503) 338-0106</u>	
Pacific	
North Coastal tributaries (Columbia R. to Nehalem Bay)	July 15 - October 31 (CO*)
Necanicum River & tributaries	July 15 - October 15 (CHF,STW*)
Nehalem	
Nehalem Bay	October 1 - February 15 (MAR,SHL,CHS,CHF,CO,STW,*)
Lower Nehalem River (below Hwy 26)	May 1 - September 30 (CHF*)
N. Fk. Nehalem River	July 15 - September 15 (CHS,STW*)
Cook Creek	July 15 - September 30 (CHF,STW*)
Salmonberry River	August 15 - September 15 (CHS,STW*)
Other Lower Nehalem River Tributaries	July 15 - September 30 (CHF,CO,STW*)
Upper Nehalem River (above Hwy 26)	July 15 - August 31 (CHS,STW*)
Columbia	
Columbia River Estuary	November 1 - February 28 (MAR,SHL,CHF,CHS,SS,CO,STW,STS,CTS*)
Youngs River	July 15 - September 30 (CO,STW*)
Wallooskee River	June 1 - September 30 (CO,CTS*)
Other Columbia R. Est. Tribs. (Mouth to Tongue Pt.)	July 1 - September 15 (CHF,STW*)
Columbia River (Within District to Bonneville Dam)	November 1 - February 28 (CHF,CHS,CHR,SS,CO,CS,STW,STS,CTS*)
Other Columbia R. Tribs. (Tongue Pt. to St. Helens)	July 1 - September 15 (CHF,STW*)
Clatskanie River	July 15 - September 15 (CHF,STW*)
<u>Tillamook District - Tillamook Office - (503) 842-2741</u>	
Pacific	
Tillamook	
Tillamook Bay	November 1 - February 15 (MAR,SHL,CHF,CHS,STW,CO,CS*)
Miami,Kilchis,Wilson,Trask,Tillamook Rivers	July 1 - September 15 (CHF,CHS,STW,CO,CS*)
Netarts Bay	November 1 - February 15 (MAR,SHL,CHF,CHS,STW,CO,CS*)
Sand Lake	November 1 - February 15 (MAR,SHL,CHF,CHS,STW,CO,CS*)
Nestucca	
Nestucca Bay	November 1 - February 15 (MAR,SHL,CHF,CHS,STW,CO,CS*)
Nestucca River	July 1 - September 15 (CO,CS*)
Neskowin Creek	July 1 - September 15 (CO,CS*)
<u>Lower Willamette District - Clackamas Office (503) 657-2000</u>	
Columbia	
Columbia River (Within District below Bonneville Dam)	November 1 - February 28 (CHF,CHS,CHR,SS,CO,CS,STW,STS,CTS*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Columbia Region

Lower Willamette District

<u>WATERWAY</u>	<u>PREFERRED WORK PERIOD¹</u>
Columbia River (Within District above Bonneville Dam)	November 15 - March 15 (CHF,CHS,CHR,SS,CO,CS,STW,STS,CTS*)
Willamette	
Multnomah Channel (Scappoose Bay)	July 1 - October 31 & December 1 - January 31 (CHF,CHS,CO,STW,STS,CT,WW*)
Milton Cr. & Scappoose Cr.	July 15 - August 31 (CO,STW,JUV,WW*)
Willamette River (mouth to Willamette Falls)	July 1 - October 31 & December 1 - January 31 (CHF,CHS,CO,STW,STS,CT,WW*)
Columbia Slough	June 15 - September 15 (JUV,WW)
Johnson	
Johnson Creek (below Gresham)	June 1 - August 31 (STW,CO,CT,CHF*)
Johnson Creek (above Gresham)	July 15 - August 31 (STW,CO,CT,CHF*)
Johnson Cr. Tribs.	July 15 - August 31 (CT,STW,CO*)
Kellogg Creek	July 1 - September 30 (STW,CO,CT*)
Tryon Creek	July 15 - September 30 (STW,CO,CT*)
Clackamas River	July 15 - August 31 (CHF,CHS,STW,CO,STS,CT*)
Abernethy Creek	July 15 - September 30 (CO,STW,CT*)
Tualatin	
Tualatin River (below Scoggins Cr.)	June 1 - September 30 (CO,STW,CT,WW*)
Tualatin River (above Scoggins Cr.)	July 1 - September 30 (CO,STW,CT,WW*)
Other Tributaries	July 1 - September 30 (CO,STW,CT,WW*)
Beaver Creek	July 1 - September 30 (CT*)
Fairview Cr., Arata Cr., Salmon Cr.	June 15 - September 15 (CT,WW*)
Sandy River	July 15 - August 31 (CHS,CHF,CO,STW*)
Tanner Creek	July 15 - August 15 (CHF,CHS,CO,STW*)
Columbia River Tributaries (St. Helens to Sandy River)	July 15 - August 31 (CHF,CO,STW,CT*)
Columbia River Tributaries (Sandy River to Herman Cr.)	July 15 - August 31 (CO,STW,STS,CT*)

Northwest RegionLincoln District - Newport Office - (541)-867-4741

Pacific	
Salmon	
Salmon River Estuary	October 1 - February 15 (MAR,SHL*)
Salmon River	July 1 - September 15 (CHF,CO,CS,STW,CT*)
Devils Lake	July 1 - September 30 (CO,STW,CT*)
Siletz	
Siletz Bay	October 1 - February 15 (MAR,SHL*)
Siletz River	July 1 - August 31 (CHF,CHS,CO,CS,STW,STS,CT*)
Yaquina	
Yaquina Bay	October 1 - February 15 (MAR,SHL*)
Yaquina River (tidewater)	October 1 - March 31 (MAR,JUV*)
Yaquina River	July 1 - September 15 (CHF,CO,STW,CT*)
Alsea	
Alsea Bay	October 1 - February 15 (MAR,SHL*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources – January, 1997, v.01

WATERWAY	PREFERRED WORK PERIOD ¹
Alsea River Other Coastal Tributaries	July 1 - August 31 (CHF,CHS,CO,STW,CT*) July 1 - September 15 (CO,STW,CT*)
<u>Siuslaw District - Florence Office - (541) 997-7366</u>	
Pacific	
Yachats River	July 1 - September 15 (CHF,CO,STW,CT*)
Siuslaw River	
Siuslaw Bay	October 1 - February 15 (MAR,SHL,CHF,CO,STW,CT*)
Siuslaw River	July 1 - September 15 (CHF,CO,STW,CT*)
Siltcoos/Tahkenitch Lake system	July 1 - September 15 (CO,STW,CT*)
Other Coastal Tributaries	July 1 - September 15 (CO,STW,CT*)
<u>West Slope Willamette District - Corvallis Office - (541) 757-4186</u>	
Willamette	
Willamette River (Will. Falls to Newberg)	June 1 - October 31 & December 1 - January 31 (CHF,RB*)
Willamette River (Newberg to McKenzie River)	June 1 - August 31 (CHF,RB*)
Chehalem Creek	July 1 - October 15 (CT*)
Yamhill River	July 1 - October 15 (STW,CT*)
Spring Valley Creek	July 1 - October 15 (CT*)
Glenn Creek	July 1 - October 15 (CT*)
Rickreal Creek	July 1 - October 15 (STW,CT*)
Luckiamute River	July 1 - October 15 (STW,CT*)
Marys River	July 1 - October 15 (STW,CT*)
Long Tom River	July 1 - October 15 (CT*)
Other West Bank Will. R. Tribs. (Will. Falls to McKenzie R.)	July 1 - October 15 (CT*)
<u>Mid-Willamette District - Salem Office - (503) 378-6925</u>	
Willamette	
Molalla/Pudding River	
Molalla River (below Molalla)	June 1 - August 31 (CHF,STW,CT*)
Other Molalla River Tributaries (below Molalla)	June 1 - September 30 (CT*)
Molalla River (above Molalla)	July 15 - August 31 (CHS,STW,CT,RB*)
N. Fk & M. Fk Molalla	July 15 - August 31 (CHS,STW,CT,RB*)
Other Molalla River Tributaries (above Molalla)	July 15 - September 30 (STW,CT*)
Pudding River	June 1 - September 15 (CHS,STW,CT*)
Butte Creek	July 15 - September 30 (STW,CT*)
Abiqua Creek	July 15 - August 31 (CHS,STW,CT,RB*)
Silver Creek	July 15 - September 30 (STW,CT*)
Other Pudding River Tributaries	June 1 - September 30 (CT*)
Mill Creek	June 1 - August 31 (CHF,STW,CT,RB*)
Santiam	
Santiam River	June 1 - August 31 (CHF,STW,CT*)
North Santiam River (below Big Cliff Dam)	July 15 - August 31 (CHF,CHS,STW,CT,RB*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources – January, 1997, v.01

Northwest Region

Mid-Willamette District

WATERWAY	PREFERRED WORK PERIOD ¹
Stout Cr., Rock Cr., & Mad Cr.	July 15 - September 30 (STW,CT,RB*)
Other Santiam River Tributaries (below Big Cliff Dam)	June 1 - September 30 (CT*)
North Santiam River (above Detroit Dam)	June 1 - September 15 (K,CT,RB*)
Breitenbush River	June 1 - September 15 (K,CT*)
Lt. N. Fk. Santiam River	July 15 - August 31 (CHS,STW,CT,RB*)
Sinker, Elkhorn Cedar Creeks & tributaries	July 15 - September 30 (STW,CT,RB*)
Other Tributaries	June 1 - September 30 (CT*)
South Santiam River (below Foster Dam)	June 1 - August 31 (CHF,CHS,CT,RB*)
Crabtree Cr., & Thomas Cr.	July 15 - August 31 (CHS,STW,CT,RB*)
McDowell Cr., Wiley Cr.	July 15 - September 30 (STW,CT*)
Other South Santiam River Tributaries (below Foster Dam)	June 1 - September 30 (CT*)
South Santiam River (above Foster Dam)	July 15 - August 31 (CHS,STW,CT,RB*)
Middle Santiam River	June 1 - September 15 (K,CT,RB*)
Calapooia	
Calapooia River (below Holley)	June 1 - September 30 (CHS,STW,CT*)
Calapooia River (above Holley)	July 15 - August 31 (CHS,STW,CT,RB*)
Other East Bank Will. R. Tribs. (Will. Falls to Harrisburg)	June 1 - September 30 (CT*)

Upper Willamette District - Springfield Office - (541) 726-3515

Willamette	
Willamette River (above McKenzie River)	June 1 - October 31 (CHS,RB*)
McKenzie	
McKenzie River (below Blue River)	July 1 - August 31 (CHS,STW,CT,RB*)
Tribs. McKenzie River (below Blue River)	July 1 - October 15 (CT,RB*)
McKenzie River (above Blue River)	July 1 - August 15 (CHS,BUT,CT,RB*)
Middle Fork Willamette	
Middle Fork Willamette River (to Rattlesnake Cr)	July 1 - August 31 (CHS,STW,CT,RB*)
Middle Fork Willamette river (Rattlesnake to Hills Cr. Res.)	by specific arrangement (CHS,STW,CT,RB,OC*)
Fall Creek	July 1 - August 31 (CHS,STW,CT,RB*)
Middle Fork Willamette River tributaries	July 1 - October 15 (CT,RB*)
Middle Fork Willamette River (above Hills Creek Reservoir)	July 1 - August 15 (CHS,BUT,CT,RB*)
Coast Fork Willamette	
Coast Fork Willamette River	June 1 - October 31 (CHS,RB*)
Row River (below Dorena Res.)	June 1 - October 31 (CHS,RB*)
Row River (above Dorena Res.)	July 1 - October 15 (CT,RB*)

Southwest RegionUmpqua District - Roseburg Office - (541) 440-3353

Pacific	
Umpqua River	
Umpqua Bay & Smith Est.	November 1 - January 31 (MAR,SHL,CHS,CHF,CO,STW,STS,CT*)
Umpqua River (Scottsburg and above)	July 1 - August 31 (CHS,CHF,CO,STW,STS,CT*)
Umpqua River Tribs.	July 1 - September 15 (CHF,CO,STW,CT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Southwest Region

Umpqua District

WATERWAY	PREFERRED WORK PERIOD ¹
North Umpqua North Umpqua River (below Soda Springs Dam) Tribs. North Umpqua (below Soda Springs) North Umpqua River (above Soda Springs Dam) South Umpqua South Umpqua River South Umpqua Tribs.	by specific arrangement (CHF,CHS,CO,STW,STS,CT*) July 1 - September 15 (CHS,CO,STW,STS,CT*) June 15 - October 15 (RB,BT,BR*) July 1 - August 31 (CHF,CHS,CO,STW,CT*) July 1 - September 15 (CHF,CO,STW,CT*)
<u>Coos-Coquille District - Charleston Office - (541) 888-5515</u> <u>Pacific</u>	
Coos Coos Bay (Mouth to Catching Sl.) Coos R., Millicoma R., SF Coos R. (tidewater) Coos River and Tribs.	October 1 - February 15 (MAR,SHL,JUV,CHF,CO,STW,CT*) October 1 - March 31 (MAR,JUV,CHF,CO,STW,CT*) July 1 - September 15 (CHF,CO,STW,CT,MD*)
Coquille Coquille River Estuary (Mouth to City of Coquille) Coquille River (City of Coquille to N. & S. Fks.) Coquille River tributaries	October 1 - February 15 (MAR,SHL,JUV,CHF,CO,STW,CT*) October 1 - March 31 (MAR,JUV,CHF,CO,STW,CT*) July 1 - September 15 (CHF,CO,STW,CT*)
Tenmile Tenmile Creek & Lake Tenmile Lake tributaries	October 1 - March 31 (JUV*) July 1 - September 15 (CO,STW,CT*)
<u>Lower Rogue South Coast District - Gold Beach Office - (541) 247-7605</u> <u>Pacific</u>	
Sixes/Coastal Tributaries. Estuaries (Floras Cr.,Sixes R.) Floras Creek Sixes River	October 1 - May 31 (CHF,CO,STW,CT*) July 15 - September 30 (CHF,CO,STW,CT*) July 15 - September 30 (CHF,CO,STW,CT*)
Elk Elk River Estuary Elk River	October 1 - May 31 (CHF,CO,STW,CT*) July 15 - September 30 (CHF,CO,STW,CT*)
Euchre/Coastal Tributaries Euchre Creek Estuary Euchre Creek Hubbard Cr.,Brush Cr.,Mussel Cr.	October 1 - May 31 (CHF,CO,STW,CT*) July 15 - September 30 (CHF,CO,STW,CT*) July 15 - October 31 (STW,CT*)
Rogue River Rogue River Estuary Rogue River (below Marial) Rogue River Tributaries (below Marial)	October 1 - May 31 (CHF,STW,CT*) May 1 - September 30 (CHF*) July 15 - September 30 (CHF,STW,CT*)
Hunter Hunter Creek Estuary Hunter Creek	October 1 - May 31 (CHF,STW,CT*) July 15 - September 30 (CHF,STW,CT*)
Pistol/Coastal Tributaries Pistol River Estuary	October 1 - May 31 (CHF,STW,CT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources — January, 1997, v.01

Southwest Region

Lower Rogue/South Coast District

WATERWAY	PREFERRED WORK PERIOD ¹
Pistol River	July 15 - September 30 (CHF,STW,CT*)
Chetco/Coastal Tributaries	
Chetco River Estuary	October 1 - May 31 (CHF,STW,CT*)
Chetco River	July 15 - September 30 (CHF,STW,CT*)
Meyers Cr., Thomas Cr., & Whalehead Cr.	July 15 - October 31 (STW,CT*)
Winchuck	
Winchuck River Estuary	October 1 - May 31 (CHF,STW,CT*)
Winchuck River	July 15 - September 30 (CHF,STW,CT*)
Other Coastal Tributaries	July 15 - October 31 (CT*)
<u>Upper Rogue District - Central Point Office (541) 826-8774</u>	
Rogue	
Rogue River (above Marial)	June 15 - August 31 (CHS,STW*)
Illinois River	June 15 - September 15 (CHF,STW*)
Applegate River	July 1 - September 15 (CHF,STW*)
Other Rogue River Tributaries (above Marial).	June 15 - September 15 (CHS,STW*)
Rogue River (above Lost Cr.)	June 15 - September 15 (BT,CT*)
<u>High Deseret Region</u>	
<u>Mid Columbia District - The Dalles Office - (541) 296-8026</u>	
Columbia	
Columbia River (Within District Bonneville to John Day Dam)	November 15 - March 15 (CHF,CHS,SS,CO,STW,STS*)
Columbia River (Within District above John Day Dam)	December 15 - March 15 (CHF,CHS,SS,CO,STS*)
Columbia River Tributaries	July 1 - September 30 (STW,CO,RB*)
Fifteenmile Creek	July 1 - October 31 (STW,RB*)
Hood River	
Hood River	July 15 - August 31 (CHF,CHS,CO,STS,STW*)
Deschutes	
Deschutes River (below Pelton Dam)	February 1 - March 15 (CHF,STS,RB*)
White River	July 1 - October 31 (RB*)
Buckhollow Cr.	July 1 - October 31 (STS,RB*)
Bakeoven Cr.	July 1 - October 31 (STS,RB*)
Trout Cr. July 1 - October 31 (STS,RB*)	
<u>Ochoco District - Prineville Office - (541) 447-5111</u>	
Deschutes	
Deschutes River (Pelton Dam through Lake Billy Chinook)	July 1 - September 30 (RB,BR*)
Crooked River	
Crooked River (below Prineville Dam)	July 1 - October 31 (RT*)
Prineville Reservoir	July 1 - October 31 (RT*)
Crooked River (above Prineville Dam)	July 1 - October 31 (RT*)
N.Fk. Crooked River (above Big Summit Prairie)	July 1 - September 30 (RT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

WATERWAY	PREFERRED WORK PERIOD ¹
<u>Deschutes District - Bend Office - (541) 388-6363</u>	
Deschutes	
Metolius	
Metolius River	by specific arrangement (K, RB, BR, BUT*)
Spring Creek	July 1 - September 30 (K, RB*)
Lake Creek	July 1 - September 30 (K, RB, BR*)
Deschutes River (Lake Billy Chinook to Bend)	July 1 - September 30 (RB, BR, BUT, K*)
Squaw Creek	July 1 - October 15 (RB, BR, BUT*)
Tumalo	July 1 - October 15 (RB, BR*)
Deschutes River (Bend-North Canal Dam to Benham Falls)	July 1 - October 15 (RB, BR*)
Deschutes River (Benham Falls to Wickiup Dam)	July 1 - October 15 (RB, BR*)
Little Deschutes River	July 1 - October 15 (RB, BR*)
Fall River	July 1 - October 15 (RB, BR*)
Deschutes River (Wickiup Reservoir to Crane Prairie Dam)	July 1 - August 31 (RB, BR, K*)
Deschutes River (Crane Prairie Reservoir to Little Lava Lake)	July 1 - August 31 (RB, BT, K*)
<u>Klamath District - Klamath Falls Office - (541) 883-5732</u>	
Klamath	
Klamath River (below Keno)	July 1 - March 31 (RB*)
Klamath River (above Keno)	July 1 - March 31 (RB*)
Lost River	July 1 - March 31 (RT*)
Williamson River	August 1 - September 30 (RB, BT, BR*)
Sprague River	August 1 - September 30 (RB, BT, BR*)
Sycan River	August 1 - September 30 (RB, BT, BR*)
Wood River	August 1 - September 30 (RB, BR*)
Sevenmile Creek	August 1 - September 30 (RB*)
Klamath Lake and Agency Lake	July 1 - January 31 (RB*)
Silver Lake tributaries	July 1 - September 15 (RT, BT*)
Summer Lake	July 1 - September 15 (*)
Chewaucan River	July 1 - September 15 (RT*)
Goose Lake tributaries	July 1 - September 15 (GRT, GLAM, GSUC, GCB, PRCH, PSCL*)
Warner Valley tributaries	July 1 - September 15 (WSUC, FD*)
<u>Southeast District - Hines Office - (541) 573-6582</u>	
Columbia	
Snake	
Snake River (Malheur County)	Open
Malheur	
Malheur River (below Namorf Dam)	Open
Willow Cr. (below Brogan Cyn.)	Open
Willow Cr. (above Brogan Cyn.)	October 1 - March 31 (RB, RT*)
Cottonwood, Cr., Squaw Cr.	October 1 - March 31 (RB, RT*)
Other Tributaries	October 1 - March 31 (RB, RT*)
Malheur River (Namorf Dam to Dreswsey Valley)	November 1 - March 31 (RT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

High Desert Region

Southeast District

WATERWAY	PREFERRED WORK PERIOD ¹
North Fork Malheur (mouth to Beulah Res.)	November 1 - March 31 (RT, RB*)
North Fork Malheur (above Beulah Res.)	July 1 - August 31 (BUT, RT, BT*)
South Fork Malheur	October 1 - March 31 (RT*)
Malheur River (above Drewsey Valley)	July 1 - August 31 (BUT, RT, BT*)
Owyhee River	
Owyhee River (below dam)	November 1 - March 31 (RB, BT*)
Owyhee River (above dam)	October 1 - March 31 (RB, RT*)
Succor Creek	October 1 - March 31 (RT*)
Silvies River (above 5mi dam)	October 1 - March 31 (RT, *)
Silver Creek (above Hwy 45)	October 1 - March 31 (RT*)
Donner Blitzen River (Steen Mtns)	October 1 - March 31 (RT*)
Alvord Basin	October 1 - March 31 (LCT, AC*)
Catlow Valley tributaries	October 1 - March 31 (LCT, CTC, RT*)
Trout Creek Mountains streams	October 1 - March 31 (LCT, AC, RB, CT*)
Quinn River	October 1 - March 31 (LCT, RB, CT*)

Northeast RegionJohn Day District - John Day Office - (541) 575-1167Columbia RiverLower John Day

John Day River (below John Day)

July 15 - August 31 (STS, RT*)

Rock Creek

Rock Creek (Gilliam Co.)

July 15 - September 30 (STS, RT*)

North Fork John Day

North Fork John Day River (below U.S. 395)

July 15 - August 31 (STS, RT*)

Middle Fork John Day

Middle Fork John Day River (below US 395)

July 15 - August 31 (STS, RT*)

Middle Fork John Day River (above US 395)

July 15 - August 15 (CHS, STS, RT, BUT*)

North Fork John Day River (above U.S. 395)

July 15 - August 15 (CHS, STS, BUT*)

Upper John Day

South Fork John Day River

July 15 - August 31 (STS, RT*)

South Fork John Day River

July 15 - August 15 (CHS, STS, BUT, RT, CT*)

John Day River (above John Day)

July 15 - August 31 (STS, RB, CT*)

Canyon CreekUmatilla District - Pendleton Office - (541) 276-2344Columbia

Columbia River (John Day Dam upstream)

December 1 - March 31 (CHF, CHS, SS, CO, STS*)

Willow Creek

July 1 - December 31 (RT*)

Umatilla

Umatilla River (below Pendleton)

July 15 - October 15 (CHF, CHS, CO, STS*)

Butter Creek

July 1 - December 31 (RT*)

Umatilla River (above Pendleton)

July 1 - August 15 (CHS, CHF, STS, RT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

WATERWAY	PREFERRED WORK PERIOD ¹
Birch Creek	July 1 - October 31 (STS,RT*)
McKay Creek	
McKay Creek (below reservoir)	November 1 - March 31 (CHF,CHS,CO,STS*)
McKay Creek (above reservoir)	July 1 - December 31 (RT*)
Wildhorse Creek	July 1 - October 31 (CHF,CHS,CO,STS,RT*)
Meacham Creek	July 1 - August 15 (CHS,STS,RT,BUT*)
Walla Walla	
Walla Walla River (below Harris Park)	July 1 - October 31 (STS,RT,BUT*)
Mill Creek	July 1 - October 31 (STS,RT,BUT*)
Walla Walla River (above Harris Park)	July 1 - August 15 (STS,RT,BUT*)
<u>Wallowa District - Enterprise Office - (541) 426-3279</u>	
Columbia	
Grande Ronde	
Grande Ronde River (below Wallowa River)	July 1 - September 15 (CHF,STS*)
Wenaha River	July 1 - August 15 (CHS,STS,BUT*)
Wallowa River	July 15 - August 15 (CHS,STS,RB,BT,BUT*)
Minam River	July 15 - August 15 (CHS,STS,RB,BT,BUT*)
Joseph Creek	July 1 - March 31 (STS*)
Snake	
Snake River (state line to Hells Canyon Dam)	July 1 - October 15 (CHF,CHS,SS,STS*)
Imnaha River	July 15 - August 15 (CHS,STS*)
<u>LaGrande District - La Grande Office - (541) 963-2138</u>	
Columbia	
Grande Ronde	
Grande Ronde River (Wallowa River to Meadow Creek)	July 1 - October 15 (CHS,STS,RB,BUT*)
Lookingglass Creek	July 1 - August 15 (CHS,STS,RB,BUT*)
Catherine Creek	
Catherine Creek (to Little Creek)	July 1 - October 15 (BR*)
Catherine Creek (above Little Creek)	July 1 - July 31 (CHS,STS,RB,BUT*)
Grande Ronde River (above Meadow Creek)	July 1 - July 31 (CHS,STS,RB,BUT*)
Snake	
Snake River Reservoir	July 1 - November 30 (WW*)
Snake River Reservoir Tributaries	July 1 - October 31 (RB*)
Pine Creek	July 1 - October 31 (RB,BT,BUT*)
Powder River	July 1 - October 31 (RB,BUT*)
Burnt River	July 1 - October 31 (RB,BT*)

¹ Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

* Coded fish species defined below provide the primary basis for timing guidelines. The species list should be considered general information and is not necessarily comprehensive nor accurate.

AC - Alford chub
 BR - brown trout
 BT - brook trout
 BUT - bull trout
 CR - Crappie
 CHF - chinook salmon, fall
 CHR - chinook salmon, summer
 CHS - chinook salmon, spring
 CO - coho salmon
 CS - chum salmon
 CT - cutthroat trout (includes sea run)
 CTC - Catlow tui chub
 GCB - goose lake chub
 GLAM - goose lake lamprey
 GSUC - goose lake sucker
 JUV - juvenile salmonids

K - kokanee
 LCT - Lahontan cutthroat trout
 MAR - various marine species of fish
 MMS - Malheur mottled sculpin
 PRCH - pit roach
 PSCL - pit sculpin
 RB - rainbow trout
 RT - red band trout
 SHL - various marine shell fish
 SS - sockeye salmon
 STS - steelhead summer
 STW - steelhead winter
 WW - various warm water game fish

Work period is established for named stream, all upstream tributaries, and associated lakes within the watershed unless otherwise indicated.

Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources – January, 1997, v.01

APPENDIX D

Figure 1:
DSL Fill/Removal
Permit Cross Section

DSL FILL/REMOVAL CROSS SECTION

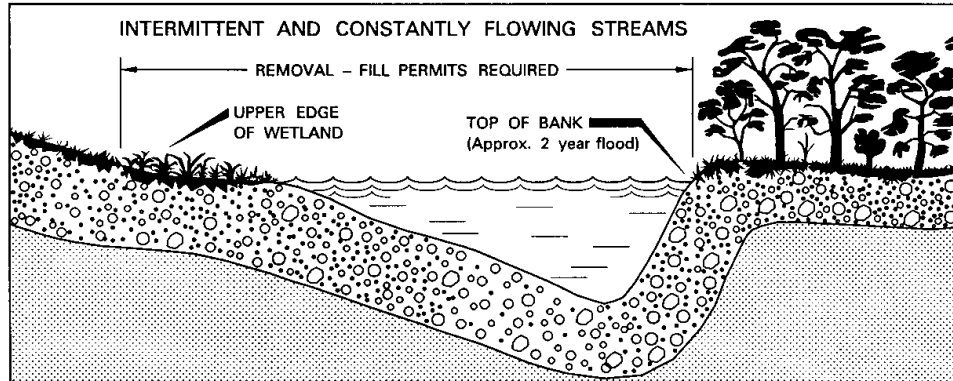


Figure 1

1. Intermittent streams, which are habitats to aquatic life, to the line of non-aquatic vegetation or bankfull stage, whichever is higher.
2. Constantly flowing streams to bankfull stage or the line of non-aquatic vegetation, whichever is higher.
3. Lakes to bankfull stage or the line of non-aquatic vegetation, whichever is higher.

APPENDIX E

Guidance For Maintenance Activities in Wetland Ditches

Oregon

DATE: June 25, 1999

TO: Maintenance Supervisors, District Managers,
Region Environmental Coordinators, Project Leaders, Project
Development Leaders, Solution Team Leaders

FROM: Doug Tindall, State Maintenance Engineer
Jeff Scheick, Technical Services Branch Manager

SUBJECT: **Guidance on Maintenance Activities in Wetland Ditches**

INTEROFFICE

MEMO

Background

ODOT maintenance crews regularly perform a variety of activities related to repair or maintenance of state highways which could involve regulated ditches and other waters of the U.S. or wetlands. When these activities affect waterways or wetlands, a Section 404 permit from the Army Corps of Engineers (ACOE) and a Fill and Removal Permit from the Oregon Division of State Lands (DSL) may be required. Ditch cleaning, reshaping, and possible wetland impacts have been of particular concern.

Guidelines on when a permit may be needed for ditch maintenance have been developed by Environmental Services and the ACOE and DSL to help the ODOT maintenance forces more efficiently do their work in compliance with all applicable state and federal regulations.

We have also attached a guidance tool designed to help maintenance personnel determine when they need to apply for permits for their maintenance work.

Clarification of Maintenance Activities and Section 404/DSL Permits

Two key considerations determine whether a permit will be needed for maintenance activities of a roadside drainage facility:

1. Is the drainage facility part of, or connected to, a stream system that contains fish or contributes resources that support fish?

Answering the question "Are fish in the drainage facility?" is the key information that determines if a permit is needed for drainage facility maintenance activities. Contact with the local ODFW fisheries biologist for information about whether fish are likely to be in a roadside drainage facility is the best means of differentiating whether a drainage facility is actually a stream, perennial or intermittent, which has been "captured" by the roadside ditch system.

East of the Cascades and in southern Oregon, the issues of highway drainage ditches and intermittent streams, and their possible contribution to fish resources in the way of food-producing areas is unclear and must be addressed on a case-by-case basis. Since there are more circumstances of intermittent streams in eastern Oregon, contact or coordination of ditch maintenance activities with the local ODFW fisheries biologists prior to ditch maintenance activities is very important in this portion of the state.

If an ODFW fisheries biologist makes a determination that there are fish resources in a drainage facility, it is not considered a ditch and any activity in the drainage facility may require a permit. The ODOT Permit Specialists must be contacted.

2. Is the proposed activity "maintenance" or does it expand or change an existing drainage facility?

All maintenance activities are allowed in a drainage ditch, even if it was constructed in a wetland, as long as the ditch is not expanded, or new structures added. The term "ditch" is used only when fish are not present in the drainage facility.

Maintenance activities allowed in a drainage ditch in a wetland include removal of sedimentation, re-grading the ditchline to the original ditchline, removal of vegetation by clearing, mowing or whatever other method is commonly used for vegetation management, culvert cleaning, and any other regular maintenance activities. Side-casting of material removed from a ditch that lies in a wetland is considered "fill" and is not allowed. Sediments or material removed from a ditch in the ditch cleaning process must be disposed of in an appropriate upland disposal site.

Installing a new or additional culvert to add capacity to an existing culvert is new work, not maintenance, as is expanding the capacity of an existing ditch, adding rip-rap, revetments, or other bank protection materials which were not originally part of the drainage or ditch system. Any of these activities is subject to the permitting process, if the initial drainage ditch or structure was originally constructed in a wetland.

In past years, we understood that ditches in wetland areas needed to be maintained or cleaned every five years to be exempt from permit requirements. This is no longer the case. A ditch, whether it is in a wetland or has wetland characteristics, can be subjected to various maintenance activities even if the ditch has not been cleaned in numerous years, if fish are not present in the drainage facility.

Possibilities for Expediting Permits for Maintenance Activities

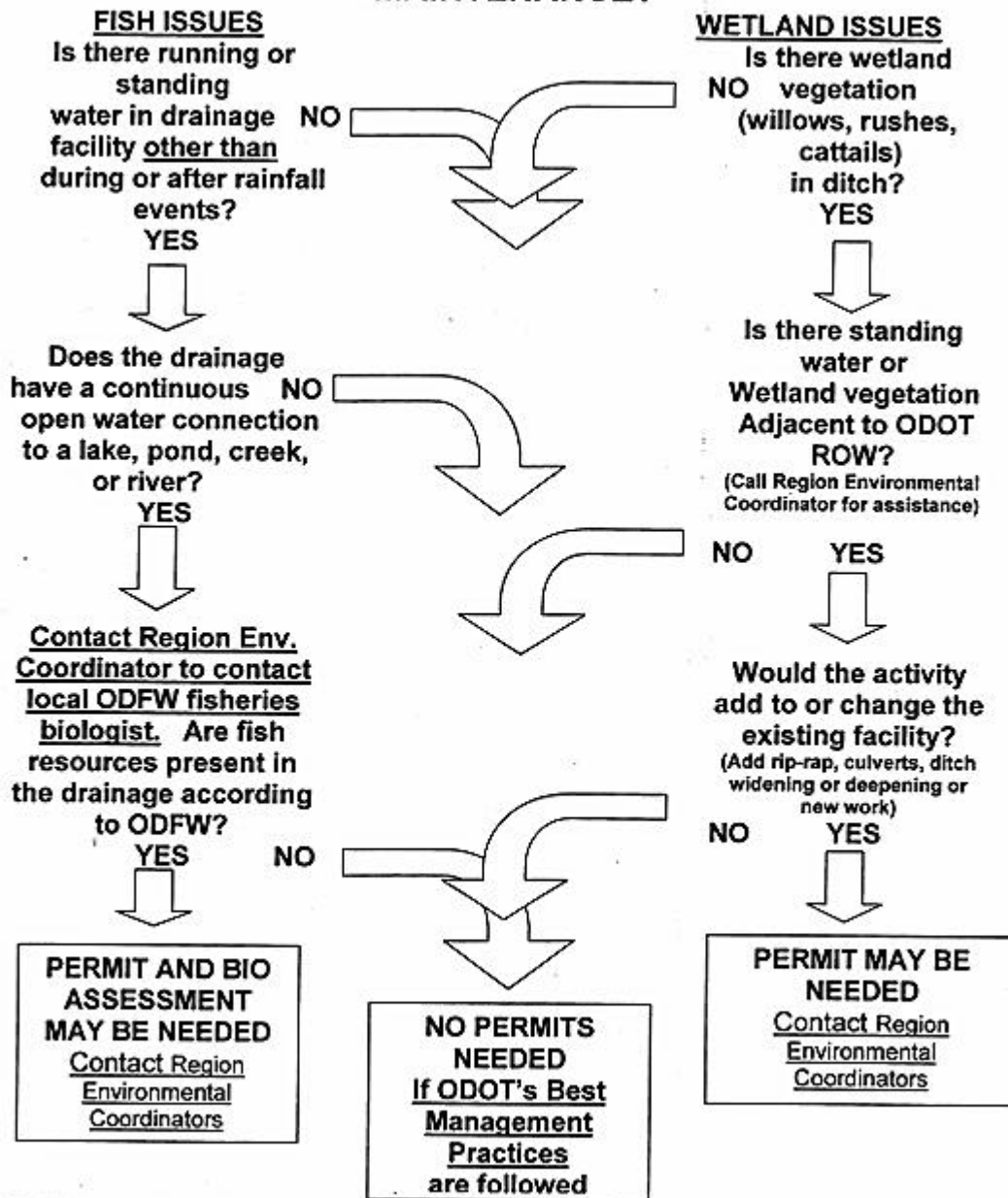
The main criteria for whether a ditch might be sensitive for maintenance activities and require a DSL permit is the presence of fish. Ditch maintenance or culvert cleaning activities could be expedited by compiling an inventory of district ditch and culvert cleaning projects. A district tour with the local ODFW fisheries biologist to get determinations of which drainage facilities support fish (i.e., are not really "ditches" but waterways), and which have no fish, and therefore fit the definition of "drainage ditch" could be conducted. This type of field coordination with ODFW would only need to take place once, if appropriately documented.

Field Guidance

Attached to this memo is a guidance flowchart for determining when permits might be needed for maintenance activities. These worksheets have been reviewed both internally, by wetland and maintenance staff, and by the Division of State Lands staff. Consultation with ACOE has also been conducted to clarify their policy on ditch maintenance activities and Section 404 Permits. The worksheet is intended to help maintenance employees determine when they may need to contact ODOT Permit Specialists before beginning any ditch maintenance activities.

Attachment: "Do We Need A Permit?" Flowchart

WHEN IS A PERMIT NEEDED FOR DITCH MAINTENANCE?



ODOT Permit Coordinators:
Julie Bunnell (503) 986-3783
Alan Lively (503) 986-3782

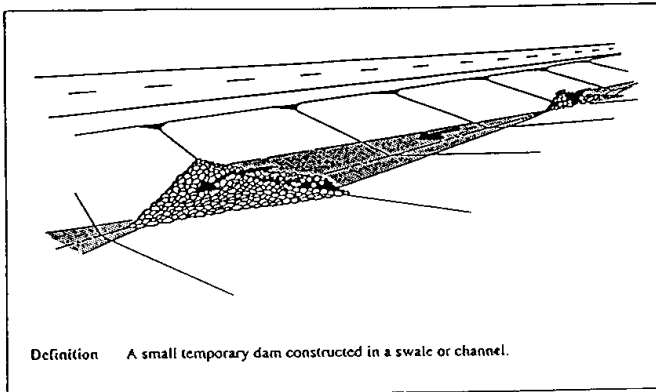
7/99

ANSWER ALL QUESTIONS FROM BOTH COLUMNS

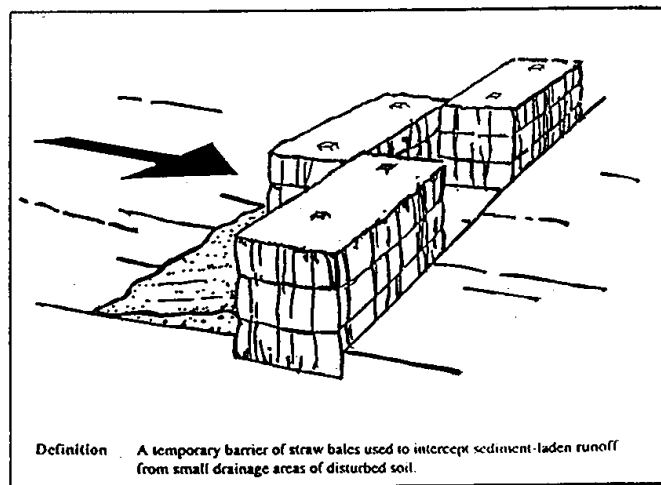
MAINTENANCE ACTION: CLEANING OPERATIONS

Erosion Control Best Management Practices

CHECK DAM



STRAW BALE BARRIER



For More Information Contact
Geo-Hydro Section
(503) 986-3370

Storm Drain Inlet Protection

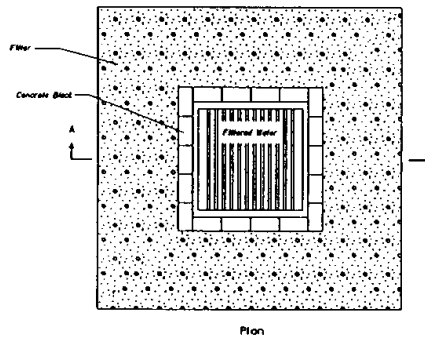
Definition: A sediment filter or excavated impounding area around a storm drain drop inlet, or curb inlet.

Purpose: To prevent sediment from entering and clogging storm drain systems prior to permanent stabilization of a disturbed area.

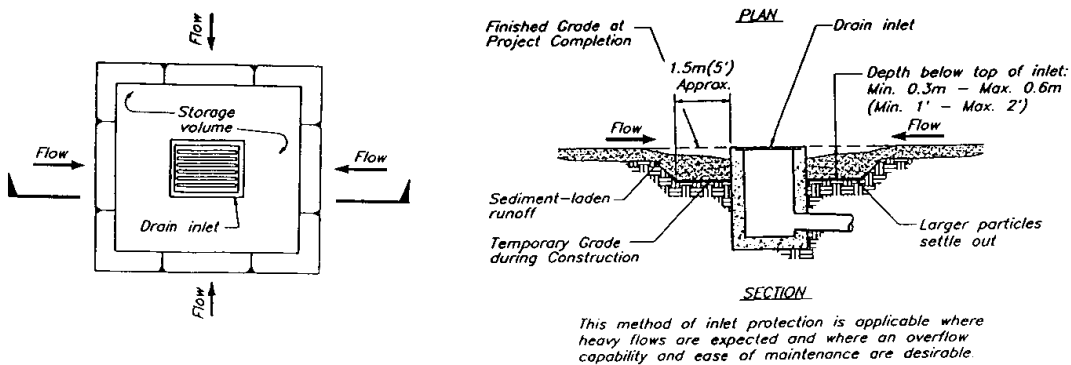
Appropriate Applications:

Protection is to be used where storm drain inlets are in place prior to permanent stabilization of the disturbed drainage area. Different types of protection are used for different structures.

- a. **Filter Fabric Covers:** applicable where the inlet is placed in concrete or asphalt, and drains a relatively small flat area (less than 0.4 ha [1 acre]) in size, with less than 5% slope. Do not place fabric under the grate as the collected sediment may fall into the drain when the fabric is retrieved.

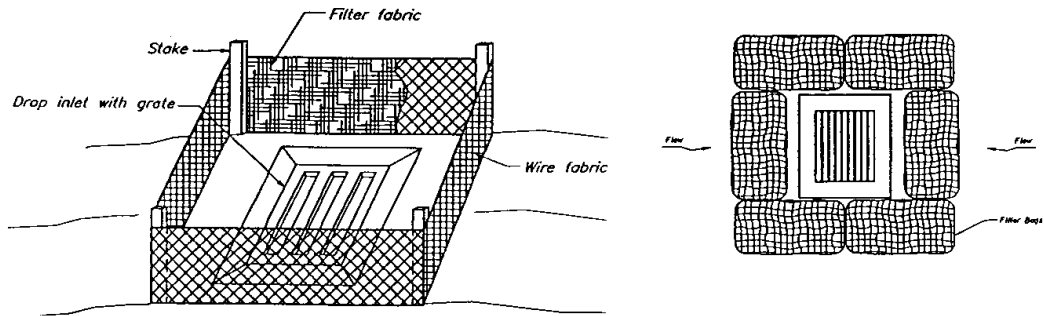


- b. **Excavated Drop Inlet Sediment Trap:** applicable where the inlet is not surrounded by concrete or asphalt. Protection against sediment entering a storm drain inlet can be provided by excavating an area around the inlet. The maximum allowable drainage area is 0.4 hectare.



Storm Drain Protection Continued

- c. **Surrounding Sediment Barrier:** Applicable when the inlet is outside of the clear zone for vehicles. This inlet can be surrounded by either a silt fence or straw bale.

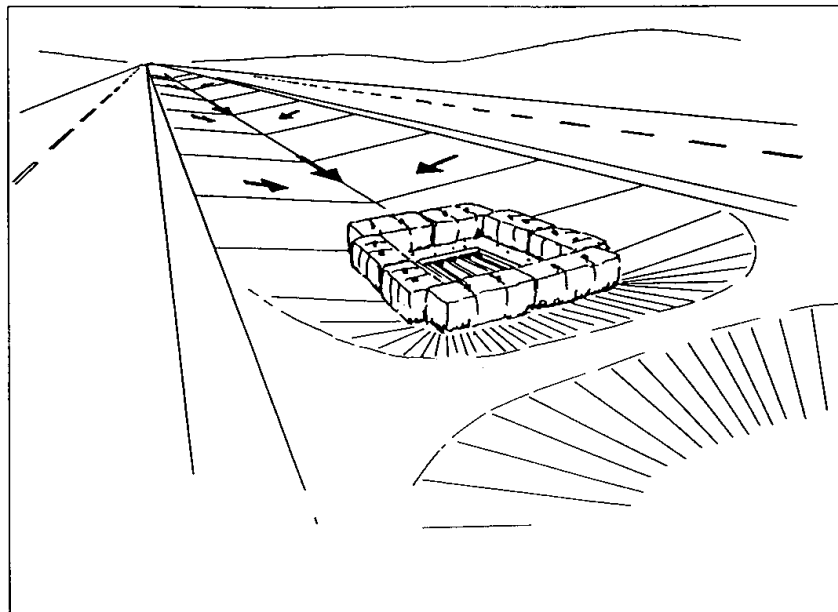


Limitations:

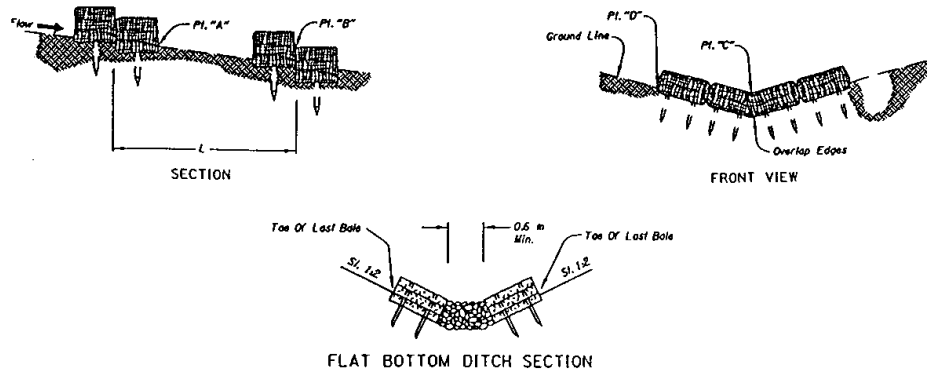
- Ponding may occur at the inlet with possible short term flooding.
- Curb inlets on slopes cannot be effectively protected because the storm water will bypass the inlet and continue downhill.
- Filter fabric is limited to storm drain inlets for small drainage areas of 2 hectares or less. For larger drainage areas, smaller sediment catchment areas are recommended.

Maintenance:

- Filter fabric placed on inlets that are surrounded by concrete or asphalt shall be kept in place by stones large enough to keep storm water velocity from pulling fabric away from the inlet.
- For systems using filter fabric: Inspections should be made on a regular basis, especially after large storm events. If the fabric becomes clogged, it should be replaced. If a sump is used, sediment should be removed when it fills approximately one-half the depth of the hole.



STRAW BALE BARRIERS



A row of straw bales placed in a trench and staked down to decrease flow velocity and act as a sediment barrier. The purpose of a straw bale barrier is to reduce runoff velocity and allow deposition of the transported sediment load behind the barrier.

When to Use it

- Below areas subject to sheet and rill erosion
- On slopes with a drainage area of 0.1 ha per 305 m or barrier length or less and maximum slope of 50% and
- In swales or ditches with a drainage area of 1 ha or less.

Do NOT use straw bales:

- In active streams
- Straw bales should not be used for extended periods of time, as they will decompose.
- Suitable only for sheet flow on slopes no greater than 2%
- Not appropriate for drainage areas larger than 0.4 hectare (1 acre).

Construction Guidelines:

- Rectangular bales of grass seed straw (weighing 20-30 kg) which are wire-bound or string-tied around the long direction. Cereal grain straw from Oregon certified seed fields may be substituted upon approval from the Engineer.
- Stakes: 40m X 40mm wood posts.

Installation

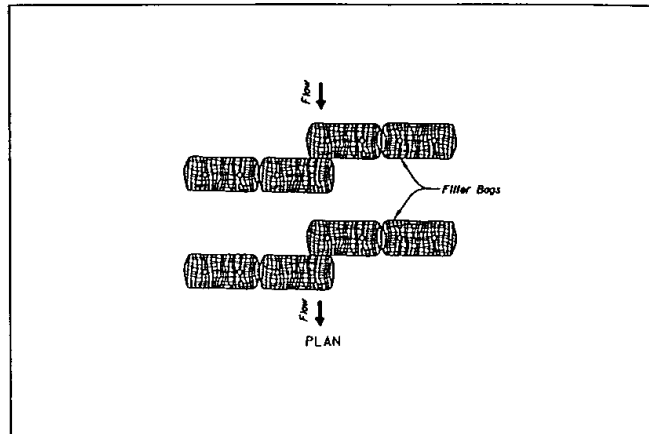
- Bales shall be placed along a level contour and in a row; with ends overlapping each other.
- Maximize ponding areas by locating bales away from toe of slopes. This also provides easier access for sediment removal.

Steps to follow include:

1. Locate the barrier along the slope contour.
2. Recess each bale into the soil a minimum of 100mm (4 inches) deep and as wide as the bales.
3. Anchor the bales with two stakes each. The first stake shall be driven toward the previously laid bale to force the bales together. Drive stakes into the bale so that they are even with the top of the bale.
4. In a channel, make the bottom ends of the end bales 150 mm higher than the top of the lowest bale.
5. Bales shall be removed when they have served their usefulness.

Maintenance

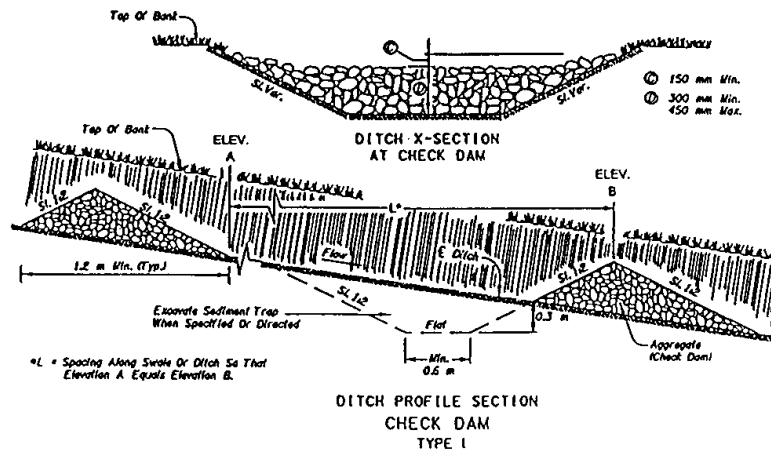
- Immediately repair any damage and replace deteriorated, destroyed, or rotted bales.
- Remove trapped sediment once it has reached 1/3 the height of the barrier.
- If channelization or short-circuiting occurs, correct the installation of the straw barrier.



Alternatives for the use of straw bales

- Sand bags.
- Biofilter bags.

CHECK DAMS



Check dams reduce the velocity of concentrated storm water flows, thereby reducing erosion and allowing sediment to settle out of the water. They are small dams built in swales or ditches.

When and Where to Use It

- In temporary or permanent swales not yet vegetated and where channel lining is not feasible,
- In permanent swales which cannot receive a lining for an extended period of time,
- If flow cannot be diverted to a stabilized outlet, and
- In small open swales which drain 4 ha (10 acres) or less.
- In active stream or rivers.

Limitations:

Check dams should not be used in live streams, and are not needed in channels that have already been lined or vegetated. Check dams can be an obstacle to traffic if they are constructed in the clear-zone.

Construction guidelines

- Construct with aggregate, stone, straw bales, logs (100 – 150 mm in diameter), or bags filled with crushed or pea aggregate.
- Use staples, twine, or other tools to anchor logs to each other.

Installation

- Place in a reasonably straight swale section to minimize erosion of the channel bends and allow ponding behind the dam.
- Space dams so that the bottom of the upstream dam is at the same elevation as the top of the downstream dam. Note that 2% slopes require a 6 mm (25") high check dam every 30 m and 4% slopes require the same check dams every 15 m. Check dams become cost prohibitive on slopes steeper than 4%.
- When channels have been covered with grass, check dams may be removed if the grass has matured sufficiently to protect the soil from erosion. On channels with slopes greater than 4%, the check dams should remain in place to continue to provide erosion control. If they are removed, the area beneath the check dams shall be mulched and seeded.
- Stabilize the area downstream of the last check dam or divert flow to a stabilized outlet.
- Place aggregate by hand or by mechanical means. Do NOT dump the rock into the swale. When large sizes of stone are used, place smaller stones, logs, or brush immediately downstream of the check dam to prevent undercutting of the dam.
- Make the center of the dam 150 mm lower than the edges. Construct the dam across the entire swale. The height of the weir should be half the depth of the swale, but not more than 0.6 m tall.

Maintenance

- Water should pass through the dam rather than under or around it. Repair the dam to stop these diversions.
- Remove sediment once it reaches half the sump depth.
- If stones have been washed downstream, add stones as needed to maintain design height and cross section. Also, be sure that structures below the check dams are not damaged or blocked due to any displaced stones.
- Clogging by leaves in the fall may be a problem.
- Remove check dams from grass-lined swales once the grass is established. Be sure to remove rock which was carried down stream. Then seed and mulch the area where the check dams were.

APPENDIX F

Guidance for Bridge Washing



Oregon

John A. Kitzhaber, M.D., Governor

Department of Fish and Wildlife

Northwest Regional Office

7118 NE Vandenberg Ave.

Corvallis, OR 97330-9446

(541) 757-4186

FAX (541) 757-4252



Sue Chase
806 Airport Road SE
Salem, Oregon 97310

Dear Sue,

This last fall you requested a set of guidelines that your maintenance forces could use to help them minimize the environmental impacts while performing bridge washing activities. Attached is the set of guidelines that Oregon Department of Fish and Wildlife drafted to minimize the impacts of this activity. We realize that this activity is very critical in being able to prolong the life of the bridge and the safety of the public. These guidelines were drafted with regard to Fish and Wildlife resources statewide and the need to comply with State and Federal regulations.

It will be my responsibility to contact you annually if there are any changes to these guidelines. Please let me know whenever I can assist on other issues.

Sincerely

Randy Reeve
ODFW/ODOT Coordinator



Oregon

John A. Kitzhaber, M.D., Governor

Department of Fish and Wildlife

Northwest Regional Office
7118 NE Vandenberg Ave.

Corvallis, OR 97330-9446

(541) 757-4186

FAX (541) 757-4252



GUIDELINES FOR BRIDGE WASHING

Bridge Washing can occur if the following criteria are met:

- 1) Occur during the period November 15 to April 1 for East of the Cascades
- 2) Occur during the period November 15 to March 15 West of the Cascades
- 3) Must occur during a high water event
- 4) Use only high pressure water
- 5) If paint is observed being displaced cease washing operations
- 6) Avoid washing tight areas (e.g. cracks, crevices) where bats may be present
- 7) If bats are observed to be displaced cease washing operations
- 8) If birds are building nests, laying eggs, tending young, no washing will occur
- 9) If any of the above criteria cannot be met, the local ODFW office must be contacted and the individual bridge will be discussed.

APPENDIX G

Guidance for Emergency Highway Repairs

Guidance for Emergency Highway Repairs

This document provides guidance to ODOT employees for notifying regulatory agencies of emergency highway repairs that will impact streams, rivers, and lakes. (See Attached)

Repairs, which require immediate action: The work has already started or will start within a few hours. The repairs will be limited to restoring the structure/roadway to the original fill design. The procedure that will be followed for this type of action is listed below.

1. Immediate action emergencies are declared by the District Manager (DM) or his representative according to ORS 401.025.
2. Weekends and Evening Hours: The DM or representative will contact the Oregon Emergency Response System (OERS) at 1-800-452-0311 and request OERS contact the Department of State Lands (DSL) duty officer. The information listed below will be provided to OERS and the DSL duty officer. On the next working day the DSL Emergency Authorization Application form* will be faxed to DSL and the ODOT staff listed below.
3. Weekday Daytime Hours: The DM or representative will contact the appropriate DSL office for the section of the state in which the work is being performed (see list below). They will identify ODOT is reporting emergency in-water work and request to be connected with the appropriate DSL representative. The information listed below will be provided to the DSL representative. After notification by phone, the DSL Emergency Authorization Application form* will be faxed to DSL and the ODOT staff listed below.

Information to provide

Phone number and name of ODOT contact person

Highway, county, and milepost number of the impact site

Name of impacted waterway

Description of the work, including estimated time to complete the repair, type of material used, size of impact area (height/length), and quantity of fill/removal in the waterway.

DSL normal working hours phone numbers:

Western Counties (503) 378-3805 FAX: (503) 378-4844

All Eastern Counties and Josephine and Jackson (541) 388-6112 FAX: (541) 388-6480

ODOT employee contacts:

Permits – Alan Lively, Julie Bunnell FAX: (503) 986-3989

Environmental – Rose Owens FAX: (503) 986-3524

Region Environmentalist – Varies per region

* The DSL Emergency Authorization Application form is not a permit or authorization. DSL will determine what regulatory action to take when it is received. ODOT support staff will provide information to other regulatory agencies as appropriate.

**DIVISION OF STATE LANDS
EMERGENCY AUTHORIZATION APPLICATION**

DATE _____ RECEIVED BY: _____

APPLICANT NAME _____ PHONE _____

Other Contact(s)/Phone no.s: _____

ADDRESS _____

PROJECT LOCATION INFORMATION:

Waterway: _____ River mile: _____ County: _____

Section: _____ Township: _____ Range: _____ Nearest City _____

Federal Wild/Scenic River? _____ Y _____ N State Scenic Waterway? _____ Y _____ N

NOTE: If State Scenic Waterway, contact with Oregon Department of Fish & Wildlife and Oregon Parks and Recreation Department is required
Driving Directions: _____

DESCRIBE NEED FOR THE PROJECT AND POTENTIAL CONSEQUENCES OF NO ACTION:

OTHER AGENCY NOTIFICATION:

☐ Oregon Dept. of Fish and Wildlife Biologist: _____ Phone No. _____ FAX: _____

Date of Contact: _____

☐ Other: _____

PROPOSED PROJECT INFORMATION:

Activity Type: _____ Waste Material Disposal Location: _____

Impact Area feet/linear area: _____ Material Used: _____

Brief Description of Project: _____

Oregon Division of State Lands Office Use Only

ADDITIONAL INFORMATION REQUESTED:

☐ Photos ☐ Cross Section Drawings

☐ Plan view showing intended work, site preparation, staging areas and temporary impacts

☐ Other: _____

Date of Request: _____

☐ DSL TELEPHONE/VERBAL APPROVAL BY: _____ Date: _____

☐ SITE INSPECTION CONDUCTED BY: _____ Date: _____

☐ Special Permit Conditions _____

☐ Entered in Data Base Permit No. _____ ☐ File Set Up

☐ Final Authorization Signed Date: _____ ☐ Monthly Report ☐ Final Log Out

Copies Distributed to: _____

DSL FILL/REMOVAL CROSS SECTION

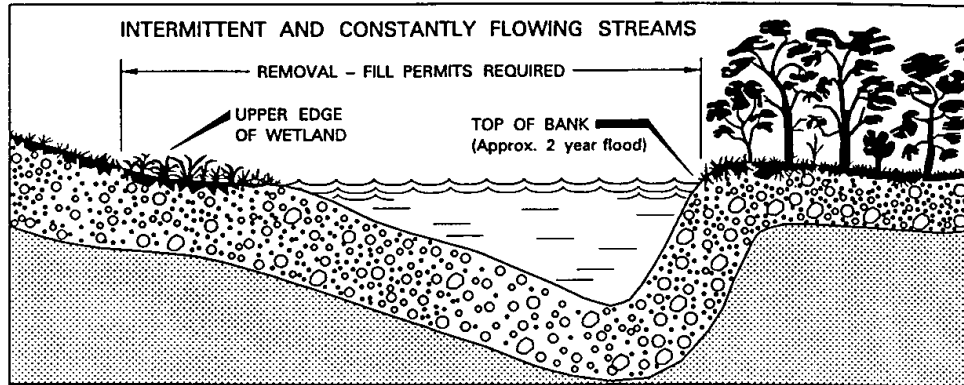


Figure 1

1. Intermittent streams, which are habitats to aquatic life, to the line of non-aquatic vegetation or bankfull stage, whichever is higher.
2. Constantly flowing streams to bankfull stage or the line of non-aquatic vegetation, whichever is higher.
3. Lakes to bankfull stage or the line of non-aquatic vegetation, whichever is higher.